DIRECT TESTIMONY OF

STEPHEN A. BYRNE

ON BEHALF OF

SOUTH CAROLINA ELECTRIC & GAS COMPANY

DOCKET NO. 2008-196-E

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND POSITION.

A. My name is Stephen A. Byrne and my business address is 1426 Main Street, Columbia, South Carolina. I am Senior Vice President of South Carolina Electric & Gas Company ("SCE&G" or the "Company") and hold a similar position at SCANA Corporation, which is the parent company of SCE&G.

I have a Chemical Engineering degree from Wayne State University. After graduation, I started my nuclear career working for the Toledo Edison Company at the Davis-Besse Nuclear Plant. I was granted a Senior Reactor Operator License by the Nuclear Regulatory Commission ("NRC") in 1987. From 1984 to 1995, I held the positions of Shift Technical Advisor, Control Room Supervisor, Shift Manager, Electrical Maintenance Superintendent, Instrument and Controls Maintenance Superintendent, and Operations Manager. I began working for SCE&G in 1995 as the Plant Manager at the V. C. Summer plant. Thereafter, I was promoted to Vice President at the

V.C. Summer plant. In 2004, I was promoted to my present position of Senior Vice President of Generation and Chief Nuclear Officer.

Q. WHAT ARE YOUR DUTIES WITH SCE&G?

A. I am in charge of overseeing the generation of electricity for the Company and, as Chief Nuclear Officer, I also oversee all nuclear operations.

Q. HAVE YOU EVER TESTIFIED BEFORE THIS COMMISSION?

A. Yes. While at V.C. Summer, I testified in a fuel clause proceeding for SCE&G. I also testified in the 2006 SCE&G electric rate case.

Q. WHAT SUBJECTS DO YOU DISCUSS IN YOUR TESTIMONY?

A. In my testimony, I will discuss the selection of nuclear units as the preferred technology to meet SCE&G's need for base load generation in the 2016-2019 time period. I will review the selection of Westinghouse AP1000 units as the units best suited to meet SCE&G's requirements, and the qualifications of Westinghouse and Stone & Webster as the contractors to build those units. I will provide an overview of the structure of the Engineering, Procurement and Construction Agreement ("EPC Contract") under which the units will be built if approved by this Commission. My testimony will also discuss the construction schedule and the contingencies contained in the Combined Application in this proceeding.

My testimony will also review the quality control, quality assurance programs, and construction oversight programs under which Virgil C.

Summer Nuclear Station ("VCSNS") Units 2 & 3 will be built if approved by the Commission. These programs include the quality assurance programs of Westinghouse/Stone & Webster, the quality assurance processes that have been involved in the selection of subcontractors by Westinghouse/Stone & Webster, and the program of construction oversight that will be put in place by SCE&G and its co-owner of this project, the South Carolina Public Service Authority or Santee Cooper. This oversight will be supplemented by intensive oversight of construction activities by the NRC and by oversight as provided for in the Base Load Review Act by the Office of Regulatory Staff ("ORS").

In addition, my testimony will discuss the risk factors related to the construction program; issues related to spent fuel storage and disposal, and decommissioning; the NRC permitting process and schedule; and the overall construction schedule for the units.

THE JENKINSVILLE SITE

Q. THE APPLICATION IN THIS PROCEEDING CONCERNS TWO WESTINGHOUSE AP1000 UNITS THAT SCE&G SEEKS TO BUILD NEAR JENKINSVILLE, S.C. MR. BYRNE, COULD YOU PLEASE DESCRIBE THE SITE WHERE SCE&G's NEW AP1000 UNITS WOULD BE LOCATED?

A. The new units are to be located at the present site of VCSNS Unit 1 in Jenkinsville SC, approximately 15 miles west of Winnsboro and 26 miles northwest of Columbia. Jenkinsville itself is located approximately three miles southeast of the site. The Broad River is located approximately one mile west of the site. The 6,800 acre Monticello Reservoir is also located on the site.

Q. WHAT OTHER GENERATING FACILITIES ARE LOCATED AT THE SITE?

A. VCSNS Unit 1 achieved criticality in October of 1982 and went into commercial operation on January 1, 1984. Like the proposed AP1000 units, Unit 1 is also a Westinghouse pressurized water reactor. The Fairfield Pumped Storage unit, which uses Lake Monticello as the upper reservoir of the Parr/Monticello Pumped Storage hydroelectric system, is also located on the site. The Parr Shoals hydro facility, which has been in operation since 1914 and today serves as the lower reservoir of the Parr/Monticello Pumped Storage hydroelectric system, is also located on the Broad River adjacent to the site. The four Parr simple cycle gas turbines are also located at the site.

Q. WHERE ON THE SITE WOULD SCE&G's NEW AP1000 UNITS BE LOCATED?

A. The new units will be located on a construction site of approximately 500 acres located slightly less than one mile to the south southwest of VCSNS Unit 1.

Q. HOW WAS THIS SITE SELECTED?

A. Attached to my testimony as **Exhibit A (Hearing Exhibit __ (SAB-1))** is Exhibit A to the Combined Application. **Exhibit A** contains a detailed description of the site selection process and I would ask that all of **Exhibit A** be incorporated into this testimony by reference. I would also refer the Commission and the parties to **Exhibit A** for additional details concerning that selection process. In addition, environmental and geological information concerning the site is summarized on Exhibit P to the Combined Application which Company Witnesses Summer, Connor and Whorton will sponsor.

As indicated in **Exhibit A**, SCE&G conducted a site selection study for one or more possible new nuclear units in 2005. This 2005 site selection study included a review of the multiple prior studies, including the following: the studies conducted in originally selecting the location of the VCSNS Unit 1; studies and evaluations done in the mid-1970s to select possible sites for a second nuclear unit; and several evaluations and studies conducted during the subsequent years to support the possible siting of fossil-fueled plants on SCE&G's system.

Q. PLEASE DESCRIBE THOSE STUDIES?

A. Extensive site selection work was done in siting VCSNS Unit 1. Thereafter, a siting study conducted by the consulting firm of Dames & Moore in 1974 evaluated 18 potential nuclear power plant sites located across the SCE&G service territory as possible sites for a second nuclear power plant for SCE&G's system. In the 1980s, SCE&G commissioned additional site selection studies (Dames & Moore 1982, 1988) to identify sites for potential future fossil-fueled power plants. These studies, while not focused on the specific requirements for siting nuclear units, considered many factors that apply to nuclear and fossil-fired base load plants (*i.e.,* transmission access, rail access, water supply, proximity to load centers, environmental considerations, etc.). These studies consistently identified the Jenkinsville site as being among the most suitable of the sites on SCE&G's system for the construction of a new, base load generating unit.

In 2005, SCE&G revaluated the 18 original Dames & Moore sites based on the data and information that had been compiled in the earlier study. Based on the 2005 evaluation, SCE&G determined that none of these 18 sites evaluated in addition to the VCSNS Unit 1 Site were obviously superior to VCSNS as sites for a new nuclear plant, especially considering the following:

- VCSNS’ status as an existing nuclear power plant site, the extensive nuclear-related infrastructure and personnel already present on the site, as well as SCE&G’s 26 years of experience in nuclear operations at that location;
- The availability on the VCSNS site of suitable construction sites and adequate water supply for the construction of new units;
- The availability of existing rail transportation and transmission infrastructure on the VCSNS site; and
- The VCSNS site’s favorable location with respect to SCE&G system loads.

The 2005 siting study then compared VCSNS to a previously unevaluated location at the U.S. Department of Energy’s Savannah River Site (“SRS”) which was proposed for consideration at that time. Screening-level criteria developed from the Electric Power Research Institute’s (“EPRI”) Existing Site Criteria were applied to the evaluation of the two sites.

Using all available data and criteria based on the EPRI site criteria, detailed site suitability evaluations of the two alternative sites were conducted and overall composite site suitability ratings were developed.

The VCSNS site scored higher than the SRS site in the criteria of rail access, transmission access, and seismic suitability. The two sites were rated as being essentially equal in the remaining criteria. See **Exhibit A**

(SAB-1), Table 1, page 8 of 18, and accompanying text. Overall, based on this composite evaluation, VCSNS was found to be a superior location for the new unit.

Q. IN YOUR OPINION, AND BASED ON YOUR MORE THAN 20 YEARS EXPERIENCE IN NUCLEAR POWER PLANT OPERATIONS, IS THE JENKINSVILLE SITE A GOOD SITE FOR THE NEW UNITS?

A. Yes, in my opinion the Jenkinsville site is a superior site for the new AP1000 units. It has a solid base of existing electric transmission assets, and established rail access located in close proximity to one of the principal rail lines from Columbia to North Carolina. The site benefits from the fact that there are exiting nuclear operations on site as well as extensive nuclear support services and nuclear security services that can be shared with additional units. Furthermore, the nuclear operations team that currently operates VCSNS Unit 1 is well recognized for its efficiency and effectiveness and for the strength of its nuclear operating culture. This team and its culture will provide a substantial advantage to the new units because they will be the foundation on which the team and culture for the new units will be built.

Q. WHAT ABOUT WATER SUPPLY FOR THE NEW UNITS?

A. The water supply situation at the site is quite favorable due to the presence of the Monticello and Parr Reservoirs. The new units will draw make-up water from the Monticello Reservoir which in turn draws water from the Parr Reservoir by means of the Fairfield Pumped Storage Facility. The Parr Reservoir is filled by water flow of the Broad River. At full operating capacity, the new units will require approximately 62 cfs of make-up water supply net of the water that is returned to the Broad River basin. The long-term annual mean flow of the Broad River is approximately 6,300 cfs. The lowest annual mean flow is approximately 2,150 cfs. Therefore, the consumptive water use for the new units is about one percent (1%) of the annual mean flow and two point nine percent (2.9%) of the lowest annual mean flow. The 7Q10 is the standard measurement representing low flow conditions used by the United States Geological Survey and others. It is measured by calculating the seven-day, consecutive low flow with a ten year return frequency. In other words, it is the lowest stream flow for seven consecutive days that would be expected to occur once in ten years as calculated by the United States Geological Survey. The 7Q10 flow for the Broad River at the Alston metering station, which is the closest such station to the site, is 853 cfs. Consumptive water use of the new units would represent about seven percent (7%) of the 7Q10 flow. In addition, the water storage capacity in the Monticello Reservoir mitigates the effects of low river flows on the Broad River at Parr. When at normal maximum pool level, the Monticello Reservoir contains a draw-down water reserve of 29,000 acre feet. After accounting for evaporative losses and other expected consumptive uses, the 29,000 acre feet of water reserve is adequate to operate all three nuclear units, without pulling any additional water from Parr Reservoir for approximately two and a half months. Moreover, using the Fairfield Pumped Storage units pumps, the reservoir can be re-supplied with water whenever supplies in the Parr Reservoir are adequate and can be managed to protect in-stream needs and downstream uses of the Broad River.

Q. WHAT ARE THE GEOLOGICAL, GEOTECHNICAL AND SEISMIC CONDITIONS ON SITE?

A. The geological, geotechnical and seismic studies of the site are summarized in Exhibit P to the Combined Application, which Mr. Whorton will sponsor and discuss at greater length. As the site of an existing nuclear unit, the site has been well studied for seismic stability. In addition, seismic stability is an issue that the NRC will review carefully in issuing the combined operating license for VCSNS Units 2 & 3.

In summary, the site is characterized by very sound granite bedrock that is located below several layers of soil (clay and saprolite). Given the conditions there, the site meets the foundation design requirements for an AP1000 unit reactor design as certified by the NRC.

The soil and rock conditions on site are also quite favorable for nuclear construction. The bedrock provides a very good foundation for nuclear construction and is located near enough to the surface of the plant grade to make it possible to construct nuclear island foundation mats for the units directly on bedrock.

Q. WHAT ARE THE ENVIRONMENTAL CONDITIONS ON SITE?

A. The Company's witnesses, Mr. Summer and Mr. Connor, will testify in detail concerning the extensive environmental studies and assessments that have been done at the site. Those studies and assessments are part of the material comprising the application for a Combined Operating License ("COL") for VCSNS Units 2 & 3 that is currently pending before the NRC. The studies and attachments are massive documents of approximately 1,100 pages in length. They are publically available and will be closely scrutinized by the NRC in making its licensing decision related to the units.

I have reviewed the environmental studies related to the plant and know the site well based on my nine years as plant manager and as vice president in charge it its operations. Because of the length of time that nuclear operations have been conducted on site, environmental and operating conditions in and around the site are well understood. I agree with the conclusions of the studies and the witnesses sponsoring them that VCSNS Units 2 & 3 are not likely to have significant adverse environmental effects. All told, the site is exceptionally well-suited as a location for two new AP1000 units.

OVERVIEW OF THE AP1000 UNITS

Q. COULD YOU PLEASE DESCRIBE THE AP1000 UNITS THAT SCE&G INTENDS TO BUILD AT THE SITE?

A. I would be happy to. Included in **Exhibit A (SAB-1)** are a series of slides that show the AP1000 design, and where the proposed units will be located at the Jenkinsville site. I will refer to these slides as I make this presentation.

The AP1000 unit is an advanced passive-safety pressurized water reactor designed by Westinghouse Electric Company, LLC ("Westinghouse"). Design Certification for the AP1000 was granted by the Nuclear Regulatory Commission in 2004. This certification was based on the Design Certification Document which incorporates Revisions 1-15. Other design enhancements are pending before the NRC but do not change the status of the AP1000 design as one that is fully design certified by the NRC.

Q. WHAT IS A PRESSURIZED WATER REACTOR?

A. A pressurized water reactor, or PWR, is one of the two principal types of commercial nuclear reactors in use in the United States today. The other type is a boiling water reactor or BWR. In a pressurized water reactor like an AP1000 unit or VCSNS Unit 1, there are two separated loops of water. In the primary loop, water is heated in the reactor core under pressure such that it does not boil, and is fed into steam generators (*i.e.,* heat exchangers) located inside the containment vessel. In the steam generators, the heated primary water flows through a series of tubes which are surrounded by water from the secondary loop. The water in the secondary loop boils into steam. The steam from this secondary loop of water feeds into the turbine to generate electricity and then exhausts to the condensers to be condensed back into water.

In a boiling water reactor, water is converted to steam directly in the reactor core. This steam is fed into the turbine generator to produce electricity, and then into the steam condensers to be condensed back to water to complete the feed water cycle. In other words, in a BWR there is only one loop of cooling water, and it circulates through both the reactor core and the turbine.

Q. WHAT ARE THE RELATIVE ADVANTAGES OF THE TWO TECHNOLOGIES?

A. The principal advantage of boiling water reactors is simplicity. BWRs have a single feed water loop and no steam generators. However, in a BWR, steam produced in the reactor core goes through the turbine and condenser units and that steam can contain a small but measurable amount of radioactivity. In a pressurized water reactor, however, the steam generator isolates the water that comes into contact with the reactor core from the water in the secondary loop that powers the turbine. The water that comes into contact with the reactor core goes no further than the steam generator. While both designs have their advantages, SCE&G has the most experience with pressurized water reactors since VCSNS Unit 1 uses that design.

Q. WHAT IS THE DIFFERENCE BETWEEN PASSIVE AND ACTIVE REACTOR TECHNOLOGIES?

A. Reactor safety systems are designed to provide water to the reactor when necessary to cool the core, and limit the production of additional heat. Safety systems are also designed to cool the atmosphere in the containment vessel when required to keep pressures in the vessel within safe limits. Active plant technology does this using pumps that take water from tanks and transfer it either to the reactor core or to containment atmosphere cooling units. These systems require valves which must be opened and closed. Electrical power is also required to operate many of these pumps and valves.

By contrast, passive safety reactors, which are the most advanced reactor designs commercially available today, rely on elevated cooling water tanks and use the force of gravity to move the cooling water to the reactor core or to the external wall of the containment vessel to keep the containment atmosphere cool. Passive designs rely on valves that operate automatically and do not require electric motors.

Q. WHAT ROLE DO PASSIVE SAFETY SYSTEMS PLAY IN THE DESIGNS OF THE UNITS THAT USE THEM?

A. Passive safety systems use only natural forces, such as gravity, natural circulation, and compressed gas to accomplish the task of providing cooling water to the reactor core and dissipating heat to the atmosphere. There are no pumps, fans, diesel generators, chillers, or other power operated machinery required for the safety systems, thus eliminating the need for safety-related AC power sources.

Q. HOW IS THE AP1000 UNIT RATED FOR SAFETY?

A. In granting Design Certification Document for the AP1000 unit, the NRC found that the AP1000 unit met the NRC's safety and risk criteria with large margins. The NRC requires that plants be designed such that the risk of core damage resulting from an emergency will occur 1 time or less in 10,000 years of operations. The results of the Probabilistic Risk Assessment for the AP1000 design show a core damage probability of 1 or less in every 2.5 million years of operations. This is an exceptionally high safety rating. I should note that even in case of core damage, the containment vessel and other safety equipment contained in the AP1000 design are intended to prevent any discharge of radioactivity.

Q. WHAT ARE THE PRINCIPAL STRUCTURES IN AN AP1000 PLANT?

A. Each AP1000 plant consists of five principal generation structures - the nuclear island, the turbine building, the annex building, the diesel generator building, and the radwaste building, all as shown on Figure 6 to **Exhibit A, (SAB-1)**.

Structures that make up the nuclear island include the containment vessel, the shield building, and the auxiliary building. The reactor and steam generators are located in the containment vessel. The auxiliary building houses the control room and the spent fuel pool.

The turbine building houses the turbine, the generator, the condenser, and associated mechanical and electrical systems. The annex contains the control support area, a machine shop, the ancillary diesel generators, other electrical equipment and various heating, ventilation, and air conditioning systems.

The AP1000 design includes two non-safety related diesel generators which are located in the diesel generator building to provide backup power in the event of disruption of the normal power source. The radwaste building contains facilities for the handling and storage of plant low-level waste.

The cooling towers for the circulating water system are located southeast of the proposed new units. Each cooling tower has a concrete shell with fan stacks on top rising to a height of approximately 70 feet. The fans generate air flow across sprayed water to reject heat to the atmosphere. The four cooling towers occupy an area of approximately 38 acres.

In addition the new units will have two service-water system cooling towers (one per unit). These mechanical draft cooling towers require an area of approximately 0.5 acre per unit and are located near the turbine building. The proposed new units share common intake structures, discharge structures, and certain support structures such as office buildings, water treatment, and waste handling facilities.

The Monticello Reservoir will be used as the supply source for makeup water for the circulating water and service water cooling towers. The plant discharge will be to the Parr Reservoir. The new intake structure will be located approximately 1,250 feet west of the VCSNS Unit 1 intake facilities. An additional intake structure for a new water treatment facility which will supply potable and filtered water to VCSNS Units 2 & 3 will be located approximately 5,500 feet east of the VCSNS Unit 1 intake facilities.

SELECTION OF THE AP1000 UNITS

Q. WHEN DID SCE&G BEGIN THE PROCESS OF SELECTING AP1000 TECHNOLOGY FOR VCSNS UNITS 2 & 3?

A. As Mr. Marsh has testified, SCE&G identified the need for base load capacity in the 2016-2019 period before 2005 and began the process of selecting the appropriate base load technology in 2005.

Q. WHAT TECHNOLOGIES DID SCE&G CONSIDER?

A. Nuclear, coal and combined cycle gas units were the principal technologies considered, although as the Company's witness Dr. Lynch will testify, alternative energy sources can serve as a supplement to these technologies. Although combined cycle units are not true base load units, their low capital costs gave them financial advantages over coal and made it appropriate for us to consider them in spite of their intermediate nature. Dr. Lynch will testify in more detail about the resource planning studies on which the final selection decisions were based. Those studies are summarized in Exhibits G and H to the Combined Application.

Q. WHY DID SCE&G CONSIDER NUCLEAR TECHNOLOGY IN THIS EVALUATION?

A. From my perspective, SCE&G decided to devote serious attention to the option of nuclear construction because of the volatility and cost of natural gas supplies, the capital costs of environmentally compliant coal technology, and the uncertainties surrounding the costs and nature of future regulation of CO_2 discharges.

Q. WHAT TECHNOLOGIES AND VENDORS DID SCE&G EVALUATE?

A. In 2005, SCE&G identified three possible nuclear technologies and vendors for detailed evaluation. Those were:

1. The Westinghouse – Advanced Passive Pressurized Water Reactors, (AP1000),
2. The General Electric - Economic Simplified Boiling Water Reactor (ESBWR), and
3. The UniStar/AREVA - Evolutionary Power Reactor (EPR).

The AP1000 and ESBWR are passive safety designs with the EPR being an active safety design.

Q. WHY DID SCE&G SELECT THE GE, WESTINGHOUSE AND AREVA REACTOR TECHNOLOGIES AS THE REACTOR TECHNOLOGIES TO EVALUATE?

A. GE, Westinghouse, and AREVA are three of the leading suppliers of nuclear systems today. Approximately 80% of the active nuclear reactors in the United States today were built by Westinghouse or GE. AREVA, which is owned by the French Government and Seimens Corporation, is the principal builder of the more than 55 nuclear reactors that supply France with approximately 80% of its electricity. All three companies are reliable, technically-skilled and competent suppliers of nuclear systems and technologies. According to the NRC, the three designs that SCE&G evaluated represent all but a small number of the reactors proposed for construction in the United States as of mid-2008 for which technology has been specified.

Q. HOW DID SCE&G GO ABOUT EVALUATING AND COMPARING THESE THREE TECHNOLOGIES?

A. SCE&G provided each supplier with a series of approximately 400 technical and financial questions about its unit. Each supplier's responses were evaluated for seven technical criteria and were subject to a separate financial evaluation. A detailed discussion of the selection process and evaluation is contained in Exhibit B to the Combined Application, a copy of which is attached as **Exhibit B Hearing Exhibit ___ (SAB-2))** to my testimony and which I incorporate into my testimony by reference.

Q. WHAT WERE THE EVALUATION CRITERIA USED TO SELECT THE AP1000 UNITS AND WHAT WEIGHT WAS GIVEN TO EACH IN THE EVALUATION PROCESS?

A. The seven technical evaluation criteria and weighting factors for each were as follows: Ability to Meet Desired Schedule – 25%; Design Features – 20%; Equipment Attributes – 15%; Regulatory Risks to Obtaining COL – 15%; Construction/Organization Attributes – 10%;

Long Term O&M Considerations – 5%; and Collaboration Opportunities and Preferences – 10%.

Q. WHAT WAS THE RESULT OF THE EVALUATION?

A. The result of that evaluation was the decision made in 2006 to select the Westinghouse AP1000 technology as the most suitable technology for SCE&G's needs. Both the technical and financial evaluations, which were conducted by independent teams within the Company, indicated the AP1000 technology to be the preferred choice. Once that decision was made, SCE&G continued negotiations with Westinghouse and began work on an EPC Contract for AP1000 units. SCE&G revisited the selection process in 2006-2007 and confirmed the selection of the AP1000 units using similar but slightly expanded evaluation criteria which are set forth in **Exhibit A (SAB-1)**.

Q. WHAT WERE THE ADVANTAGES OF THE AP1000 UNITS AS COMPARED TO OTHER TECHNOLOGIES?

A. The principal advantages of the AP1000 technology were found in the areas of Licensing, Ability to Meet Schedule, Cost, Collaboration Opportunities and Technology Preference.

Q. WHAT WERE THE ADVANTAGES OF THE AP1000 UNITS RELATED TO COST?

A. There were several cost related advantages of the AP1000 units which were related not only to raw dollars per kilowatt (or "$/kW") cost of construction, but also to the size of the units, the advantages of their passive safety design and their operational and maintenance compatibility with VCSNS Unit 1.

Q. PLEASE EXPLAIN.

A. The AREVA EPR technology is an update of a traditional pressurized water reactor technology that AREVA's predecessor company, Framatome, obtained from Westinghouse in the 1960's and perfected in the multiple standardized units constructed for Electricitié de France during the last 40 years. For SCE&G's purposes, the size of the AREVA unit was a drawback. A single AREVA EPR unit is rated at 1,600 MWe (megawatts electrical) and two units could not be efficiently accommodated on the Jenkinsville site and on our system due to the size of the available construction site, transmission cost considerations, and the power needs of SCE&G. In addition, the AREVA EPR units have an active safety design which greatly increases the amount of nuclear safety equipment required to be procured, installed and maintained for the units to operate in compliance with their NRC licenses. The active safety features increase the cost and complexity of initial construction, as well as the cost and complexity of maintaining the units once in service. Furthermore, these features make the plant's physical footprint and size of buildings to be maintained much larger than other types of units, which can also lead to increased costs both of construction and of operation over the lifetime of the plant.

The GE ESBWR (Economically Simplified Boiling Water Reactor) incorporates a state of the art passive shutdown system with the simplicity of a boiling water design and had many attractive features. But like the AREVA design, it too had the disadvantages from SCE&G's perspective of large size (1,555 MWe). Furthermore, a boiling water reactor like the ESABWR is quite dissimilar from a pressurized water reactor in design, in operating and control characteristics, and in components and equipment. Since SCE&G's nuclear operating experience is with a pressurized water reactor, adding a boiling water reactor to the Jenkinsville site would have increased the projected cost of training and staffing and of operating and maintaining the units when in service.

By contrast, at 1,117 MWe, the AP1000 was sized such that two units could easily be accommodated on the Jenkinsville site. Building two units had the advantage of allowing the completion of the units to be staggered to better meet SCE&G's anticipated load growth. Two units also provide for a more reliable generation resource since the unavailability of a single unit due to refueling or forced outage would only affect half of the new nuclear capacity being added to the system. In addition, the ability to build two units for a total of 2,234 MWe created better economies of scale, better use of the existing Jenkinsville site infrastructure, and a better cost per kWh than building a single, large GE or AREVA unit. Furthermore, two AP1000s represent a pool of megawatts large enough to support the needs both of SCE&G and Santee Cooper which furthered SCE&G's interest in partnering with Santee Cooper to diversify the financial risk of the project. In addition, the current VCSNS Unit 1 is a Westinghouse pressurized water reactor, and the similarities between it and the AP1000 unit in design, operating characteristics, equipment and components will simplify training, operations and maintenance going forward, thereby reducing costs.

In the end, SCE&G concluded that the construction and operation of two AP1000 nuclear power plants would have the lowest capital cost per megawatt, would be competitive with the other reactor technologies on long term operations and maintenance cost, and would have the best site utilization for the Jenkinsville site. Considering the AP1000's advanced licensing and design status, as discussed below, along with the ability to share costs through collaboration with the other utilities considering these units, SCE&G judged the AP1000 to be the best technology for cost containment during design, construction and operations.

Q. YOU MENTIONED COLLABORATION OPPORTUNITIES AS AN ADVANTAGE OF THE AP1000 TECHNOLOGY. PLEASE EXPLAIN WHAT YOU MEAN BY THIS.

A. Taking a cue from the success and efficiency of the French nuclear program, the NRC has adopted a policy that for practical purposes requires standardization of the new nuclear units built according to each supplier's

NRC certified design. Each of the new units built using each NRC certified design (*i.e.*, AP1000 units, ESBWR units, or EPR units) will be practically identical. The NRC has stated that it does not expect there to be any material differences in design or engineering between them except for necessary site-specific modifications in things like orientation and placement of structures. In addition, to make the licensing process more efficient, the NRC has asked that the potential owners and the designer of each current reactor design collaborate in filing a lead or "reference-plant" Combined Operating License Application ("COLA"), which will serve as the foundation for the review and licensing of each subsequent unit.

Q. HOW WILL THE REFERENCE PLANT COLA RELATE TO LATER APPLICATIONS?

A. Once a reference plant Combined Operating License ("COL") is issued for a given design, the NRC will allow reference to the standard sections of that reference plant COLA for follow-on power plants of like design. As a result, the reference COLA for the AP1000 unit will form the core of the non-site specific sections of the COLA for VCSNS Units 2 & 3. The NRC then has only to review the standard sections once in the reference plant COLA, and then review the site-specific sections for each individual plant.

Q. WHAT SORT OF COLLABORATION OPPORTUNITIES DOES THIS DESIGN AND LICENSING APPROACH CREATE?

A. This standardized approach to design and licensing creates a number of opportunities for utilities to share and reduce costs through collaboration. The first such opportunity is that the AP1000 builders will share the cost of preparing a reference plant COLA and obtaining a reference plant COL on a pro rata basis. The Department of Energy will also share in part of the cost of the reference plant COLA as part of its initiative to promote energy independence by reinvigorating the nuclear power industry in the United States.

Q. WHAT IS INVOLVED IN OBTAINING A COL?

A. At the COL stage, all plant specific systems, facilities, operating protocols and processes, are licensed by the NRC for construction and operation.

Q. HOW IS SCE&G COLLABORATING WITH OTHER UTILITIES IN THE COLA PROCESS FOR THE AP1000 DESIGN?

A. Through its participation in NuStart Development, LLC, SCE&G and other entities considering building AP1000 units are assisting in coordinating the AP1000 Reference Plant licensing and sharing the cost of the engineering and application.

Q. ARE THERE OTHER COLLABORATION OPPORTUNITIES FOR UTILITIES CONSIDERING CONSTRUCTION OF SIMILAR UNITS?

A. Yes. The standardization of units means that there will be opportunities for utilities building similar units to share knowledge and experience throughout the construction process, and throughout the operating lives of the units. There will be opportunities for owners of similar units to collaborate on equipment, process and training improvements or upgrade projects for decades to come. SCE&G intends to actively pursue the benefits of such collaboration throughout the operating lives of VCSNS Units 2 & 3.

Q. WHICH UTILITIES ARE PLANNING TO BUILD AP1000 UNITS?

A. At present, based on published NRC reports, Duke intends to construct two AP1000 units in Cherokee County, SC; Southern Company has signed an EPC contract to construct two units at Plant Vogtle outside of Augusta, GA; Progress Energy has announced plans to construct two AP1000 units in Levy County, FL, and two more at Plant Harris outside of Raleigh, NC; Florida Power and Light has announced plans for two AP1000 units at Turkey Point, FL; and the Tennessee Valley Authority has submitted the reference COLA for two plants to be constructed at the Bellefonte site in Tennessee. All told, U.S. utilities have announced plans to construct fourteen AP1000 units, which is more than double the number of announcements for any other design. All of these units are planned for the Southeastern United States, and SCE&G has a long and very positive history of cooperation with the utilities building these units. The number, ownership and location of units create significant opportunities for collaboration and cost sharing among the prospective AP1000 owners.

Q. PLEASE DESCRIBE THE CURRENT STATUS OF THE REFERENCE COLA PROCESS FOR THE UNITS SCE&G EVALUATED?

A. A graphical presentation of the status of all COLAs currently pending before the NRC is attached as Attachment A to **Exhibit B (SAB-2)** to my testimony. The COLA for the TVA Bellefonte Units 3 & 4 (AP1000 Reference Unit) was submitted for NRC review on October 30, 2007. The COL for this unit is expected to be issued in 2011. The reference COLA for the GE ESBWR, the North Anna plant, was submitted November 2007, and the reference COLA for the AREVA EPR, the Calvert Cliffs plant, was submitted in March of 2008.

Q. HOW DID THESE FACTS PLAY INTO THE EVALUATION OF THE AP1000 UNIT?

A. SCE&G concluded that the greatest opportunity for collaboration was with the AP1000 technology, both in licensing and construction and in the long term operations. It is likely that the largest number of units to be built in the Southeast and the nation in the near future will be the AP1000 units. The number of these units will provide substantial benefits of potential collaborative efforts.

Q. HOW DID THE AP1000 SCORE IN YOUR EVALUATION AS TO TECHNOLOGY PREFERENCE?

A. The AP1000 unit was the only unit evaluated that combined pressurized water technology and passive safety features. As mentioned above, pressurized water reactor technology is more attractive to SCE&G than boiling water reactor technology because of the knowledge base and experience the Company has with pressurized water reactors as a result of operating VCSNS Unit 1 for the past 26 years.

In addition, as discussed in **Exhibit A (SAB-1)**, passive safety features dramatically simplify nuclear plant design. Because of its passive design, the AP1000 design contains approximately 60% fewer valves, 75% less piping, 80% less control cable, 35% fewer pumps, and 50 percent less seismic building volume than would be found in a comparable active safety system reactor. Because there are fewer pumps, valves, and piping, the operator has less cost related to on-going regulatory oversight and compliance programs, inspection requirements, maintenance programs, and procurement of supplies, services and replacements. In SCE&G's evaluation, the smaller, simpler, AP1000 design with significantly fewer components provides a clear advantage over active plant designs in regard to long term operations and maintenance considerations.

Q. HOW DID THE AP1000 SCORE IN YOUR EVALUATION AS TO ABILITY TO MEET SCHEDULE?

A. For a number of reasons, SCE&G gave the AP1000 a strong evaluation as to ability to meet construction time tables. Those reasons include the regulatory status of the AP1000 design; the simplicity of the design; Westinghouse's experience and standing in the nuclear industry; the corresponding experience and status of its consortium partner, Stone & Webster; and the modular construction techniques proposed for the units. SCE&G also sees advantages from being among the first of several AP1000 units, and other nuclear units, under active consideration for construction in the United States. Advantages from being at the head of the line for building a unit include preferential access to equipment, labor and the overall nuclear construction supply chain, as well as having first call on the time and attention of the contractors and subcontractors involved. In addition, the Westinghouse/Stone & Webster consortium agreed to commit contractually to the 2016 Commercial Operation Date for VCSNS Unit 2 with monetary penalties for failure to meet that date.

Q. HOW IS THE WESTINGHOUSE/STONE & WEBSTER CONSORTIUM QUALIFIED TO CONSTRUCT THESE UNITS?

A. This consortium is very well qualified to meet its commitments to construct these units. As stated in more detail in **Exhibit A (SAB-1),** Westinghouse has provided the nuclear systems for the large number of the nuclear generating plants in operation in the United States today and Stone & Webster was construction contractor for a comparable number. The two companies are globally recognized as leaders in nuclear systems design and manufacture, and in power plant construction respectively.

NEGOTIATION OF THE EPC CONTRACT

Q. PLEASE DESCRIBE THE NEGOTIATION OF THE EPC CONTRACT WITH WESTINGHOUSE/STONE & WEBSTER.

A. Shortly after the AP1000 technology was chosen in the late 2005 evaluations, SCE&G began to negotiate an EPC contract with the Westinghouse/Stone & Webster consortium. The negotiations were concluded on May 23, 2008, more than two and a half years after they began. The terms of the resulting EPC Contract are summarized later in my testimony.

Q. PLEASE DESCRIBE THE NEW NUCLEAR DEPLOYMENT TEAM THAT WAS INVOLVED IN THE NEGOTIATION OF THE EPC CONTRACT.

A. The new nuclear deployment team included a group of SCE&G employees with a diverse range of construction and contracting experience. Some team members had been involved early in their careers in construction of VCSNS Unit 1 and the Fairfield Pumped Storage unit. Some had been involved in nuclear plant operations for decades and had assisted in managing projects like the VCSNS Unit 1 steam generator replacements, the license renewal for VCSNS Unit 1, and the highly important and time-sensitive maintenance and upgrading work that has taken place during Unit 1's seventeen refueling outages. Others had been involved the design, procurement and construction oversight of major projects related to our fossil hydro facilities, including negotiating the engineering, procurement, and construction contracts for Cope Station construction, Jasper Station construction and the Urquhart Repowering projects; the Saluda Dam Remediation project, and major environmental upgrade project like the installation of scrubbers at Williams and Wateree Station; Wateree cooling tower construction; and the installation of selective catalytic reactors at Cope.

Q. WHY DID THE NEGOTIATIONS TAKE MORE THAN TWO YEARS?

A. The negotiations took more than two years principally because SCE&G insisted both on price and schedule assurances that Westinghouse/Stone & Webster was not initially prepared to give. In the early stage of the negotiations, the consortium provided indicative pricing that was attractive, but they were not willing to give significant contractual assurances fixing those prices. This pricing began to rise as negotiations proceeded. SCE&G insisted on a significant part of the price being made firm or fixed. Prices began to trend upward as negotiations proceeded.

Q. WHAT CAUSED THIS CHANGE FROM THE INITIAL INDICATIVE PRICING?

A. There are undoubtedly a number of reasons. Increasing global demand for energy and the weakness of the U.S. dollar clearly contributed to general cost increases. During this time, there was a general increase in the cost of commodities and materials –things like copper, cement, steel, nickel and chromium. But in addition, this was a period of rapidly increasing global competition for power plant components and equipment, things like pumps, valves, wire and cable, piping and the like. We also know that during this time Westinghouse/Stone & Webster, GE, AREVA and others were working with their supply chain to firm up prices for the key components that would be required to support the construction of multiple new nuclear units during the coming decade. Suppliers of these types of equipment and components were faced with having to make significant investments in expanded production capability to support the requirements of this surge in power plant demand. SCE&G believes that the cost of this investment in new production capacity found its way into the prices Westinghouse/Stone & Webster received from its suppliers.

Q. HOW DID SCE&G RESPOND TO THIS INCREASE IN PRICE?

A. As Mr. Marsh indicated, in late 2006, SCE&G broke off negotiations with Westinghouse/Stone & Webster, reopened its discussions with all three original vendors and conducted a full reappraisal of its options. The

Company asked each of the original potential suppliers to revisit the information provided to the Company during the 2005 solicitation, specifically including indicative prices. A second evaluation and scoring of responses against evaluation criteria was done.

Q. WHAT DID SCE&G DETERMINE?

A. The responses received in early 2007 showed that the prices and costs of all suppliers had increased by amounts comparable to those of Westinghouse/Stone & Webster. This validated that the price increases from Westinghouse/Stone & Webster were in fact an indication of broad-based increases in cost in the nuclear supply chain and the construction industry generally. The analysis of costs and level of price certainty, along with other evaluation criteria, confirmed our initial selection of the AP1000 units as the appropriate unit.

Q. WHAT DID SCE&G DO NEXT?

A. SCE&G then reopened negotiations with Westinghouse/Stone & Webster. Through the Company's review of the consortium's pricing and vendor quotes, we were able to assure ourselves again that these price increases, while unwelcome, nonetheless reflected actual market conditions and reasonable assumptions as to quantities of materials, equipment, and components being priced. Even at the increased prices, nuclear technology was still preferable to the other generation options under consideration.

Q. HOW DID NEGOTIATIONS PROCEED DURING 2007?

A. During 2007, SCE&G continued to press Westinghouse/Stone & Webster for pricing that was reasonable and at the same time was backed by binding contractual commitments. In the end, the consortium was able to provide acceptable pricing, in part by obtaining price concessions from their vendors and other members of the supply chain.

Q. WHEN DID SCE&G CONCLUDE THE EPC NEGOTIATIONS?

A. The EPC Contract with Westinghouse/Stone & Webster was signed in May 23, 2008.

TERMS OF THE EPC CONTRACT

Q. PLEASE PROVIDE AN OVERVIEW OF THE EPC CONTRACT?

A. A detailed summary of the EPC Contract is contained in Exhibit C to the Combined Application in this proceeding which is attached to my testimony as **Exhibit C, Part One (Hearing Exhibit ___ (SAB-3))** and incorporated by reference. SCE&G is also filing as **Exhibit C, Part Two (Hearing Exhibit ___ (SAB-3-P))** which is a public version of the EPC Contract. **Exhibit C, Part Three (Hearing Exhibit ___ (SAB-3-C))** is a confidential version of the EPC Contract being filed under seal and being provided to those parties that have signed confidentiality agreements with SCE&G.

The following is a summary of its principal terms of the EPC Contract, but more detail can be found in **Parts One, Two and Three of Exhibit C (SAB-3).**

Q. WHO ARE THE PARTIES TO THE EPC CONTRACT?

A. The signatories to the EPC Contract are as owner, South Carolina Electric & Gas Co., for itself, and as agent for the South Carolina Public Service Authority (Santee Cooper), and as contractor, the consortium consisting of Westinghouse Electric Co., LLC (Westinghouse) and Stone & Webster, Inc. Westinghouse is a subsidiary of Toshiba Corp. (Toshiba) and Stone & Webster is a subsidiary of the Shaw Group, Inc. (Shaw).

Q. WHAT IS THE ALLOCATION OF RESPONSIBILITIES AND STANDARDS OF PERFORMANCE FOR CONSTRUCTION?

A. Under the EPC Contract, Westinghouse/Stone & Webster will provide the design, engineering, procurement and installation of the equipment and materials, and construction and testing of two nuclear units based on the AP1000 design. As required by the EPC Contract Westinghouse/Stone & Webster will perform and complete their obligations in accordance with applicable safety rules, environmental laws and other laws, the terms of the EPC Contract itself, applicable industry codes and standards and good industry practices, all of which are explicitly defined in the EPC Contract. Westinghouse/Stone & Webster is solely responsible for all construction means, methods, techniques, sequences, procedures, safety and quality assurance and quality control programs in connection with the performance of the Westinghouse/Stone & Webster work. The consortium is required to ensure that accurate work schedules and financial projections are communicated to SCE&G and Santee Cooper along with accurate information concerning the progress of the project and its financial status. These reporting obligations are clearly defined in the EPC Contract in Section 3.5.

Q. WHAT ARE SCE&G'S RESPONSIBILITIES UNDER THE EPC CONTRACT?

A. The EPC Contract provides a detailed Scope of Work/Supply and Division of Responsibilities for Westinghouse/Stone & Webster and SCE&G. As owner, SCE&G is responsible for obtaining, maintaining and paying for all SCE&G permits and licenses, to include the Combined Operating License for the units. SCE&G is responsible for the execution of start-up testing. Westinghouse/Stone & Webster is contractually committed to providing support in this permitting, licensing and start-up effort including support for NRC inspections, tests and analysis in accordance with the NRC's Integrated Tests, Acceptance and Approval Criteria ("ITAAC").

Q. WHAT IS THE CONSTRUCTION SCHEDULE FOR THE UNITS?

A. The Guaranteed Substantial Completion Dates for VCSNS Units 2 & 3 are April 1, 2016 and January 1, 2019, respectively. Attached to the

Combined Application in this proceeding as Exhibit E is an Anticipated Construction Schedule for the Units including major milestones. This Exhibit is also attached to my testimony as **Exhibit E (Hearing Exhibit ___ (SAB-5))** and incorporated by reference. This Exhibit E incorporates items from the General Project Schedule, attached as Exhibit E to the EPC Contract (**Exhibit C, Part Three (SAB-3))** to this testimony), supplemented with certain site-specific milestone dates provided by Westinghouse/Stone & Webster to assist in preparation of **Exhibit E**.

Q. WILL THIS SCHEDULE BE UPDATED?

A. Yes. On or before September 30, 2008, Westinghouse/Stone & Webster will provide a complete site-specific schedule for the project which will be substituted for Exhibit E to the EPC Contract.

Q. IN SUPPORT OF THE CONSTRUCTION SCHEDULE, WHAT PROCUREMENT ACTIONS TOOK PLACE BEFORE THE EPC CONTRACT WAS SIGNED?

A. In order to meet the construction schedule, on March 31, 2008 SCE&G issued a Limited Authorization to Proceed to Westinghouse/Stone & Webster for the procurement of long lead time forgings and other components. By issuing this limited authorization to proceed, SCE&G was able to secure its place in line for these key components of the units.

Q. WHAT PRECONDITIONS DOES THE EPC CONTRACT IMPOSE ON THE CONSTRUCTION SCHEDULE FOR THE NEW UNITS?

A. The construction schedule is conditional upon SCE&G providing Westinghouse/Stone & Webster with full notice to proceed in time for construction of the nuclear safety related items to be completed. It is anticipated that the first preparation of the rock surface below the containment building will occur in July of 2011; the first nuclear safety related concrete pour will follow approximately three months later. This nuclear island base mat will serve as the foundation for the nuclear island for VCSNS Unit 2. Pouring this concrete will require the COL for VCSNS Units 2 & 3 to be in effect at that time. Once the full notice to proceed is provided there will be no other major contingencies related to the substantial completion guarantee, except force majeure events or unanticipated problems with the other permits required for construction to proceed.

Q. WHAT IS THE SCHEDULE FOR OBTAINING A COL FOR VCSNS UNITS 2 & 3?

A. The Combined Construction and Operating License Application for VCSNS Units 2 & 3 was submitted to the NRC on March 31, 2008. While as mentioned above, NRC approval of the COLA is required prior to the initiation of nuclear safety related construction, but non-nuclear safety related pre-construction activities may proceed upon the approval of the

Public Service Commission in this proceeding and other permitting agencies.

Q. WHAT PROVISIONS DOES THE EPC CONTRACT CONTAIN PERTAINING TO QUALITY ASSURANCE?

A. Westinghouse/Stone & Webster is fully responsible for the quality assurance and quality control for their work on VCSNS Units 2 & 3. However, SCE&G will oversee this quality assurance and control closely. Westinghouse/Stone & Webster must employ a Project Quality Assurance Program ("PQAP") that will meet all applicable NRC requirements and other provisions of the Code of Federal Regulations and that is accepted by SCE&G. It must ensure compliance with the AP1000 Nuclear Power Plant Design Control Document which is the basis on which the COL certification will be granted. The PQAP will be supplemented by the construction management and oversight function that SCE&G and Santee-Cooper will put in place (described later in my testimony), along with on-going inspection by NRC inspectors. SCE&G has detailed and long-standing knowledge of Westinghouse's corporate quality assurance program since it is the program under which Westinghouse provides services to VCSNS Unit 1 today. With regard to Stone & Webster, SCE&G is aware that they have been and currently are performing a large amount of work in the nuclear industry, including the construction of the mixed-oxide fuel (MOx) facility at the Savannah River Site and completion of construction of TVA's Browns Ferry plant. SCE&G will audit Stone & Webster's QA throughout the work period and will audit and inspect the work of their subcontractors and suppliers. SCE&G is fully confident as to Westinghouse/Stone & Webster's ability to provide the required quality control and quality assurance over this project.

Q. WHAT ROLE WILL NRC OVERSIGHT PLAY IN ASSURING THE QUALITY OF CONSTRUCTION?

A. Westinghouse/Stone & Webster and the vendors of nuclear safety related components must meet stringent NRC quality standards. Because VCSNS Units 2 & 3 will be built under a Combined Operating License, from a regulatory standpoint the level of NRC oversight and control over the site will be significant. That oversight will be comparable to what it would be for an operating nuclear power plant, although focused specifically on construction and fabrication rather than operations. The NRC has indicated that SCE&G can expect as many as seven NRC inspectors to be on-site full time during construction. The number of inspectors will be staged and will begin with module fabrication on site. Also, NRC inspection teams will be sent to the site on a regular basis to inspect specific activities such as module fabrication, welding, ITAACs, start-up and testing. The NRC will also send teams in to review both owner and constructor programs, such as, the corrective action program. The NRC will also enforce NRC fitness for duty regulations for nuclear safety related construction.

Q. PLEASE EXPLAIN THESE NRC FITNESS FOR DUTY REGULATIONS.

A. The NRC's fitness for duty regulations, which are still in the process of being finalized, are intended to provide reasonable assurance that nuclear plant personnel, including construction personnel, will perform their tasks in a reliable manner; that they are not under the influence of any substance, legal or illegal, that may impair their ability to perform; and that they are not mentally or physically impaired from any cause, including fatigue, illness or emotional distress, that can adversely affect their ability to competently perform their duties. Requirements include pre-employment screening, drug and alcohol testing, post-accident testing, and on-the-job behavioral assessment.

Q. WHAT PROVISIONS ARE CONTAINED WITHIN THE EPC CONTRACT SPECIFICALLY REGARDING SUBCONTRACTORS AND MAJOR EQUIPMENT VENDORS?

A. Westinghouse/Stone & Webster may use those subcontractors and major equipment vendors on the project which are identified in the EPC Contract in Exhibit P or who are added to Exhibit P subject to SCE&G's review. Exhibit D to the Combined Application, which is attached as **Exhibit D (Hearing Exhibit ___ (SAB-4))** to this testimony and incorporated herein by reference, provides an overview of the Westinghouse/Stone & Webster quality assurance program for vendors and subcontractors and a list of 19 of the most significant suppliers of major equipment or services as specified in the EPC Contract at present. Other major subcontractors may be added to Exhibit P and used on the project only if SCE&G does not object to them after opportunity for review of their qualifications. Nonetheless, Westinghouse/Stone & Webster remains at all times responsible for assuring that all work and equipment meets the requirements of the EPC Contract.

Q. WHAT SPECIFIC QUALITY ASSURANCE PROVISIONS DOES THE EPC CONTRACT CONTAIN RELATED TO SUBCONTRACTORS?

A. The EPC Contract includes detailed requirements for subcontractor quality assurance, reporting of defects and noncompliance to SCE&G and Westinghouse/Stone & Webster, quality control and inspection activities by SCE&G and Westinghouse/Stone & Webster to ensure subcontractor performance, access and auditing of quality control by SCE&G at Westinghouse/Stone & Webster facilities and subcontractor facilities. The contract specifies witness and hold points for manufacturing and fabrication of equipment and SCE&G's right to participate in those witness and inspection activities and to stop work if dissatisfied. The EPC Contract contains specific provisions granting SCE&G reasonable access to the work in progress at the Westinghouse and Stone & Webster's facilities and their subcontractors' facilities for on-going observation and inspection, including auditing of activities for conformance with the requirements of the PQAP .

Q. WHAT IS YOUR CONCLUSION CONCERNING THE QUALIFICATIONS OF SUBCONTRACTORS AND MAJOR EQUIPMENT VENDORS TO PERFORM UNDER THE EPC CONTACT?

A. As part of its due diligence in reviewing the supporting documentation for the EPC contract, SCE&G has evaluated the suppliers and subcontractors found in Exhibit P and the Westinghouse/Stone & Webster quality assurance programs under which they will operate. Many of these subcontractors and vendors are subcontractors and vendors that SCE&G has known for decades and has worked with successfully in operating VCSNS Unit 1 and in operating its other electric generating stations. As mentioned above, SCE&G has worked with Westinghouse extensively during the last four decades and understands both its internal quality assurance programs, and the programs that it applies to subcontractors and vendors. Based on all of these factors, it is my opinion that the subcontractors and vendors listed on Exhibit P to the EPC Contract and **Exhibit D (SAB-4)** to this testimony are competent and reliable to perform as subcontractors and vendors to the project. It is also my opinion that the quality assurance and audit programs for subcontractors and suppliers going forward are appropriate and sufficient and are capable of protecting the interests of SCE&G and its customers in the quality of the construction and equipment that will make up the new units.

Q. PLEASE DESCRIBE THE PRICING PROVISIONS OF THE EPC CONTRACT.

A. SCE&G's cost of the new units under the EPC contract is set forth in Exhibit F to the Application, which Company Witness Best is sponsoring and will explain in more detail. The costs of the Westinghouse/Stone & Webster components of the construction project are based on the pricing provisions of the EPC Contact. The EPC pricing provisions are found at Articles 6 and 7, And Exhibits F, G, H, J, and K of the EPC Contract. A complete understanding of those provisions can best be obtained through a review of the EPC Contract itself, which as mentioned above is attached as **Exhibit C, Part Three (SAB-3-C)** to this testimony. However, for the convenience of the Commission and the parties, I can summarize some of the key pricing provisions of EPC Contract.

Q. WHAT ARE THE PRINCIPAL PRICING CATEGORIES UNDER THE EPC CONTRACT?

A. The EPC Contract allocates cost elements among seven categories. Those seven categories are set out in Exhibit I to the Application, which is attached to my testimony as **Exhibit I (Hearing Exhibit ___ (SAB-6))** and is incorporated by reference. The seven pricing categories reflect the different levels of price assurance provided by the EPC contract to different categories of construction costs, and in some cases, the different escalators that apply to different categories of costs. Under the EPC Contract, the seven categories of capital investment are as follows:

1) **Fixed with No Adjustment –** Included in this category are large items of equipment that Westinghouse/Stone & Webster was willing to provide at a fixed price. This category includes the major items of equipment as set forth in the confidential version of Exhibit I to the Combined Application in this proceeding. These costs are fixed per the EPC Contract and escalation is not applied. Westinghouse/Stone & Webster takes all cost risks as to these items.

2) **Firm with Fixed Adjustment A –** This category of cost includes the costs of the remaining major items of equipment, as set forth in the Confidential Version of Exhibit I to the Combined Application. **Exhibit I (SAB-6)** These items are provided at a fixed cost, with a specified escalation percentage that runs until the items are delivered and paid for. In other words, any adjustment to the firm price of this item depends only on when its components are produced and delivered on site. The escalation rate and cost items to which it applies are set forth in the Confidential Version of Exhibit I to the Combined Application. **Exhibit I (SAB-6).**

3) **Firm with Fixed Adjustment B –** This category of cost principally includes internal Westinghouse costs. These costs have a fixed annual

escalation factor applied as part of the EPC Contract. This factor is expressed in two parts. The largest component of the factor is the same fixed escalation factor that applies to Firm with Fixed Adjustment A. The other is a much smaller nuclear industry administration adjustment to compensate Westinghouse principally for the additional risks and cost related to attracting and retaining skilled nuclear engineers, technicians and experts in the current market. The escalation rate and cost items to which it applies are set forth in the Confidential Version of Exhibit I to the Combined Application.

4) **Firm with Indexed Escalation –** This category of cost includes the cost of all equipment not listed elsewhere and other items as listed on the Confidential Version of Exhibit I to the Combined Application in this proceeding. Escalation for this schedule of costs is applied periodically under the EPC Contract based on the Handy−Whitman All Steam Generation Plant Index, South Atlantic Region. Handy-Whitman is a well recognized and commonly used construction index which SCE&G has used for years for depreciation and other purposes. Company Witness Best will discuss the Handy Whitman indexes in more detail.

5) **Actual Craft Wages (Target Price) –** Site craft wages, wages for construction workers and field supervision, welders, heavy equipment operators, riggers and the like will be paid at actual costs.

6) **Non-Labor Costs (Target Price) –** This category of cost includes the cost of the construction materials, consumables, field office expenses, and the “furnish & erect” subcontractors who will provide things like warehouses and ancillary construction buildings. The costs in this category are paid at actual costs.

7) **Time & Materials –** This category of cost includes the cost of the assistance given by Westinghouse/Stone & Webster to SCE&G in permitting efforts, including the preparation of the COLA, and start up assistance rendered after substantial completion of each unit. The costs included in this category are paid at actual costs.

Q. WHAT WAS SCE&G’S GOAL REGARDING PRICING IN NEGOTIATING THE EPC CONTACT?

A. One of SCE&G’s principal goals in the negotiations was to maximize the Firm/Fixed portion of the pricing. Firm/Fixed pricing is pricing that either is not subject to escalation, is subject to escalation at a fixed rate, or is subject to escalation based on an acceptable escalator such as the Handy-Whitman escalator discussed above. These costs are not allowed to escalate due to other factors. Maximizing Firm/Fixed pricing has been important to provide SCE&G with as firm a pricing basis as possible for making the decision to proceed with nuclear construction, and to provide reasonable levels of assurance to this Commission, the public and financial markets as to the feasibility of this base load generation project and the prudence of its decision to proceed with it.

Q. HOW SUCCESSFUL WAS SCE&G IN MAXIMIZING FIRM/FIXED PRICING?

A. Presently over 50% of the total EPC Contract cost is currently subject to Fixed/Firm pricing and that category includes many major components. An additional portion of the contract cost projection may be converted to Fixed/Firm in the future upon acceptance by SCE&G of Fixed/Firm quotes from Westinghouse/Stone & Webster for additional portions of the work which Westinghouse/Stone & Webster has agreed to provide. The precise percentages in question are provided on the Confidential Version of Exhibit I to the Combined Application, which is **Exhibit I (SAB-6)** to my testimony. Ultimately, SCE&G will have the opportunity to have a substantial additional percentage of the EPC Contract priced within the Firm/Fixed category.

Q. PLEASE EXPLAIN THE TARGET PRICE PROVISIONS OF THE EPC CONTRACT?

A. The EPC Contract provides for a Target Price that applies to those portions of the work under the EPC Contract that will be done under the Actual Craft Wages and Non-Labor Costs price categories. Craft Wages and Non-Labor Costs are two of the three price categories contained in the EPC Contract that are not Firm/Fixed price categories and represent more than 90% of the current non- Firm/Fixed EPC Contract costs. The only other category of non-Firm/Fixed cost under the EPC Contract is the Time and Materials Category. This category represents work done at SCE&G's request in support of the COLA and other permitting activities that are SCE&G's direct responsibility, and is by far the smallest category of cost under the EPC contract.

Q. WHAT INCENTIVES DOES THE CONTRACT CONTAIN FOR WESTINGHOUSE/STONE & WEBSTER TO MEET ITS PRICE PROJECTIONS ON THE ITEMS THAT ARE NOT FIRM/FIXED PRICE ITEMS?

A. An Established Target Price for these categories of cost has been set in Exhibit H-1 of the EPC Contract **(Exhibit C, Part Three (SAB-3-C))**. If Westinghouse/Stone & Webster can complete the Target Price work below the Established Target Price, Westinghouse/Stone & Webster and SCE&G share the savings with the great majority of the savings belonging to Westinghouse/Stone &Webster. That ratio is a negotiated item, tied to other price concessions by Westinghouse/Stone & Webster, and one which SCE&G agreed to in part because it provides Westinghouse/Stone & Webster with a strong incentive to minimize the cost of Target Price work. Conversely, if the cost of the Target Price work exceeds the Established Target Price, then the Westinghouse/Stone & Webster profit percentage applied to this work is reduced in stages to a minimum level of the profit percentage established in the EPC Contract. All of this is set forth in greater detail in Exhibit H of the EPC Contract as are the Westinghouse/Stone & Webster profit percentages which are specified in Exhibit H of the EPC Contract, Attachment 1, at p. 12.

Q. WHAT IS YOUR OPINION CONCERNING THE TARGET PRICE TERMS OF THE EPC CONTRACT?

A. SCE&G's willingness to agree to the shared savings was critical to obtaining other price concessions from Westinghouse/Stone & Webster. It is my opinion that these Target Price terms will work as intended to provide Westinghouse/Stone & Webster with significant incentives to complete the Target Price Work within or below the Established Target Price. Doing so will help to mitigate risk as to the great majority of costs that are not Firm/Fixed costs under the EPC contract. I believe this to be a very beneficial aspect of the EPC Contract.

Q. HOW ARE CHANGE ORDERS HANDLED UNDER THE EPC CONTRACT?

A. Under Article 9 of the EPC Contract either the owners or Westinghouse/Stone & Webster can initiate change orders. Westinghouse/Stone & Webster is entitled to a change order for such things as unanticipated site conditions, delays in "full notice to proceed," a change in law or an uncontrollable circumstance as defined in Article 1 of the EPC Contract, a change in scope as defined in Exhibit A of the EPC, and other circumstances as defined in the EPC Contract. SCE&G and Santee Cooper, as owners, can request a change in the work at their initiative. The Change Order process is outlined in Article 9 of the EPC Contract. This part of the EPC Contract specifies the information required to be submitted with a change order, the requirement for review and agreement by Westinghouse/Stone & Webster and SCE&G to change orders, the payment and schedule impacts of change orders and the handling of disputes as to change orders. These change order provisions are reasonable and fair and reflect standard practice in the industry. They provide appropriate protection for SCE&G and its customers.

Q. HOW IS TESTING AND ACCEPTANCE HANDLED UNDER THE EPC CONTRACT?

A. The EPC Contract's testing and acceptance procedures and requirements are important to assure that the units and their components are built and will function as anticipated. These provisions are found in Articles 11 and 12 of the EPC Contract. The EPC Contract provides for testing and acceptance of work at four stages of the construction process.

Construction and Installation Tests -- Under the EPC Contract, all construction and installation activities will be executed, controlled and documented in accordance with quality assurance program specified in the PQAP. The first level of testing and acceptance is testing of the adequacy of construction and installation of components and systems. These can be structural components, items of piping or equipment, or other components of larger plant systems. The adequacy of the construction and installation of these systems will be verified by construction inspection and installation tests, including such things as hydrostatic testing of piping, valve testing, checking of electrical wiring, energizing and operation of components of equipment, and calibration of instruments.

Preoperational System Tests -- When the items comprising a plant system or facility are completed (*i.e.,* feedwater system, circulating water system, control rod mechanical system, etc.) the system will be turned over to the Joint Test Working Group consisting of Westinghouse/Stone & Webster and SCE&G personnel, under the direction of Westinghouse/Stone & Webster. That group will conduct preoperational testing on the system or facility to demonstrate that the components perform as an integrated system in accordance with specified design requirements and can be relied upon to function as intended in operating the plant and to meet the requirement of its COL. Baseline data on performance and condition of systems will be generated at this stage to guide in future operations and maintenance of the systems. However, the primary purpose of these preoperational tests is to assure ourselves that, after all of the various plant systems and facilities have been tested, the plant is ready for initial nuclear fuel loading and startup can be undertaken in accordance with NRC requirements.

Upon the successful completion of the preoperational test for a system or facility and provided that the other criteria specified in Article 12 of the EPC Contract are satisfied, Mechanical Completion for that system will be declared. At that point, Westinghouse/Stone & Webster will turn over care, custody and control of that system to SCE&G. Once all systems and facilities are turned over to SCE&G, mechanical completion of the plant is achieved.

Startup Tests -- At this stage, SCE&G has assumed total responsibility of the plant. The Joint Test Working Group will be released by the SCE&G Operations Group to perform startup tests on a test-by-test basis. Tests will be performed after fuel loading but before criticality, at low power (less than 5%) and then at higher power. The purpose of the startup tests will be to ensure that the unit achieves initial criticality in a controlled and carefully monitored process. These tests will also verify that all aspects of the systems operate as intended, verify that the unit's operating characteristic are all as anticipated and allow for equipment and instruments to be fully calibrated. These tests are set forth in the Design Control Documents for the Westinghouse AP1000 as approved by the NRC.

Performance Tests -- Upon successful completion of the startup tests, a performance test will be run to determine whether the unit meets the net unit electrical output guarantee. This test for each unit will be conducted during a period of continuous operation of one hundred hours. Upon successful completion of the performance test, substantial completion will be declared.

Final completion of a unit shall be deemed to have occurred upon the completion of the final completion punch list and other work required under the EPC Contract with the exception of obligations under the warranties.

Q. WHAT PENALTIES DOES THE EPC CONTRACT CONTAIN FOR DELAYS IN SUBSTANTIAL COMPLETION OF THE UNITS?

A. Article 13 of the EPC Contract specifies the liquidated damages that Westinghouse/Stone & Webster will be responsible for if there is a delay in the substantial completion date for either unit. As indicated above, substantial completion for VCSNS Unit 2 is April 1, 2016 and is January 1, 2019 for VCSNS Unit 3. Those delay liquidated damages accrue on a daily basis and are substantial. They are set out in detail in Article 13 of the EPC Contract.

Q. WHAT PROVISIONS DOES THE EPC CONTRACT CONTAIN FOR A FAILURE OF THE UNITS TO PERFORM AS ANTICIPATED?

A. Under Article 13 of the EPC Agreement, Westinghouse/Stone & Webster must pay SCE&G compensation for each KWe by which either unit falls below an agreed upon electrical output as set forth in the EPC

Contract Section 11.6, as a result of performance testing. Similarly, after the end of the second operating cycle of each unit, SCE&G and Santee Cooper will pay Westinghouse/Stone & Webster a set amount for each MWe by which the average net electrical generation by the unit during those cycles exceeds an agreed upon rating. These precise amounts are set forth in the EPC Contract.

Q. HOW WERE THESE SCHEDULE AND PERFORMANCE LIQUIDATED DAMAGES PROVISIONS ARRIVED AT?

A. These schedule and performance liquidated damages provisions were intensively negotiated as part of the more than two-year negotiation of the EPC Contract, and like other provision of the contract, are part of a package that needs to be evaluated as a whole. In my opinion, these provisions reasonably protect SCE&G's interests and are reasonable in light of the risks and complexities of the construction project.

Q. WHAT WARRANTY PROVISIONS DOES THE EPC CONTRACT CONTAIN?

A. The principal warranty provisions are contained in Article 14 of the EPC Contract. Under those provisions, Westinghouse/Stone & Webster warrants that the equipment will be free from defects in design, workmanship and material and shall conform to the design specifications and drawings for the design, engineering and construction of the Facility. Westinghouse/Stone & Webster further warrants that services, including design, engineering and construction work, shall conform to good industry practices and the requirements of the EPC Contract. The standard warranty period for this equipment runs from the scheduled time of substantial completion of each the unit, or from the date the item went into service for certain equipment that was placed into service by SCE&G before substantial completion of the unit. The warranty period for services is comparable. There is money allocated in the EPC price for SCE&G to purchase extended warranties on certain major equipment listed in Exhibit W to the EPC Contract.

Q. WHAT OTHER PROVISIONS DOES THE EPC CONTRACT CONTAIN?

A. The remaining articles of the EPC Contract cover a broad range of things such as the following: Insurance; Limitation of Liability; Liens; Proprietary Data; Intellectual Property; Environmental Controls and Hazardous Materials; Title and Risk of Loss; Suspension and Termination of Work; Safety - Incident Reporting; Qualifications and Protection of Assigned Personnel (including provisions for fitness for duty and security screening; training to environmental, OSHA, NRC and other applicable Laws, NRC Whistleblower Provision and respirator protection); Records and Audits; Taxes; Dispute Resolution; Notices; Assignment; Waiver; Modification (pertains to EPC Contract provisions); Survival; Transfer; Governing Law - Waiver of Jury Trial - Certain Federal Laws; Relationship of Owner (SCE&G) and Contractor (Westinghouse/Stone & Webster); Third Party Beneficiaries; Representations and Warranties; and Miscellaneous Provisions. Given the scope and detail contained in the EPC Contract, I would refer the Commission and parties to it for further information on these and other matters.

Q. IN YOUR OPINION, DOES THE EPC CONTRACT REASONABLY PROTECT THE INTEREST OF SCE&G AND ITS CUSTOMERS AND PROVIDE FOR REASONABLE SCHEDULE, PRICE AND QUALITY ASSURANCE REGARDING VCSNS UNITS 2 & 3?

A. Yes. In my opinion the EPC contract protects the interest of SCE&G and its customers well and provides for reasonable schedule, price and quality assurance regarding the construction of VCSNS Units 2 & 3. SCE&G has carefully analyzed and evaluated the Westinghouse/Stone & Webster pricing. We believe that the EPC Contract contains substantial price concessions from Westinghouse/Stone & Webster to SCE&G and price assurances that Westinghouse/Stone & Webster was not initially able to provide us. In the negotiation of the EPC Contract, the Company insisted on the greatest amount of price certainty possible and believes that it has been very successful in that regard, with more than one half and in the future possibly even more of the total contract price being priced in the Firm/Fixed category. We believe that the provisions related to schedule and price guarantees, warranties, liquidated damages, quality control, testing and the like, are consistent with industry standards and expectations for a contract of this magnitude and complexity and reasonably protect the interests of SCE&G and its customers.

In the final analysis, the EPC Contract represents a negotiated accommodation of the interests and concerns of four major parties, SCE&G, Santee Cooper, Westinghouse and Stone & Webster, related to a very complex, long-term project. The EPC Contract was negotiated as a package and should be considered as such. SCE&G believes that in the EPC Contract it has negotiated a very sound and favorable agreement with Westinghouse/Stone & Webster and that the terms of the EPC Contract provide a more than adequate basis for the Commission to determine that VCSNS Units 2 & 3 can be constructed within schedule and on budget.

OWNER'S COSTS AND PERMITTING

Q. WHAT ITEMS ARE INCLUDED IN OWNERS COSTS LISTED ON EXHIBIT F TO THE COMBINED APPLICATION FOR THIS PROJECT?

A. Owner's costs, which are outside the EPC Contract, principally include the costs of permitting and licensing of the new units including NuStart payments and activities, NRC fees, administrative costs, taxes and insurance costs, electricity usage, the costs of the owner's oversight and management of the construction project, and the related costs of the testing and startup of the units.

Q. WHAT PERMITTING AND LICENSING IS REQUIRED FOR THE PROJECT?

A. In addition to the current proceeding, principal permits required for construction and operating of the plant are the COL to be issued by the NRC and the other permits listed in Exhibit J to the Combined Application, which is attached to this testimony as **Exhibit J (Hearing Exhibit ___ (SAB-7))** and incorporated by reference.

Q. HOW IS THE COL APPLICATION BEING HANDLED?

A. As indicated above, SCE&G is collaborating with other AP1000 utilities to secure a reference plant COL for that design, and is sharing the cost of that endeavor. SCE&G's cost for its share of this project is estimated to be $6 million which is a fraction of what the cost would have been on a stand-alone basis. This amount is included in the owners cost line item in Exhibit F to the Combined Application. There is also a possible rebate for these costs for NuStart members when the reference plant utilities receive their COL.

In addition, SCE&G has contracted with the Bechtel Corporation to serve as the lead contractor in preparing the specific COLA for VCSNS Units 2 & 3 and securing the required COL. Mr. Steve Connor of Tetra Tech NUS, Inc. will testify concerning the environmental and site characterization aspects of the COLA. Bechtel in turn has contracted with several subcontractors, to assist in that effort.

Q. WHAT IS SCE&G'S ASSESSMENTS OF BECHTEL CORPORATION AND ITS SUBCONTRACTORS ABILITIES IN REGARDS TO THE COLA APPLICATION FOR VCSNS UNITS 2 & 3?

A. I have great confidence in Bechtel and it subcontractors and their ability to perform as required to assist the Company in obtaining a COL for VCSNS Units 2 & 3. Bechtel is one of the most experienced and well-recognized firms internationally in power systems construction, engineering and consulting services. My colleagues at SCE&G and I have an extensive knowledge of Bechtel Corporation both from direct working experience and knowledge gained through our long-standing involvement in the nuclear power industry. In my opinion, Bechtel is exceptionally capable and experienced in work of the kind that it is undertaking for SCE&G in preparing the COLA for VCSNS Units 2 & 3 and in seeing that application through the regulatory process. As mentioned above, the COLA was submitted to the NRC on March 31, 2008 and the NRC is actively reviewing this application. The NRC has already completed its COLA sufficiency review, and has declared the COLA sufficient and available for review and comment. As a result, the work of preparing the application including studies and field work itself is complete. SCE&G has been fully satisfied by the thoroughness, professionalism and competency of the work that Bechtel and its subcontractors have done to date. Bechtel continues to assist SCE&G in responding to NRC requests for further information, an expected, normal post-filing process.

Q. WHAT ARE THE COSTS INVOLVED IN OBTAINING A COL FOR VCSNS UNITS 2 & 3?

A. The cost of the COLA licensing effort, which included the site environmental and geological work, is estimated, on a 100% basis, to be approximately $48 million of which approximately $24 million has been spent and $24 million remains to be spent. Again, these costs are included in the line item for owners costs included in Exhibit F to the Combined Application. While these are considerable sums, SCE&G competitively bid the contractual support needed for the development of the application and obtained fair terms and reasonable pricing for work of this level of complexity and technical requirements. In my opinion, the cost SCE&G is incurring for this aspect of project is just and reasonable and entirely consistent with market and industry expectations.

Q. WHAT IS SCE&G'S ASSESSMENT OF ITS ABILITY TO BE SUCCESSFUL IN OBTAINING A COL FOR VCSNS UNITS 2 & 3?

A. The new nuclear deployment team, under my supervision and direction, has carefully reviewed and considered all the requirements and conditions that must be met to receive a COL for VCSNS Units 2 & 3. We have conducted a similar review of the work and analysis done by Bechtel and others as reflected in the VCSNS Units 2 & 3 COLA. Based on that review, it is my opinion, and that of the SCE&G new nuclear deployment team, that the NRC will ultimately find the COLA submitted by SCE&G to satisfy all applicable requirements and that VCSNS Units 2 & 3 will ultimately receive a COL within a time frame that will allow the Company and Westinghouse/Stone & Webster to construct the units within the construction schedules, with contingencies, submitted to this Commission in the Combined Application in this matter. That said, I would point out that the COLA review process will require approximately three years and that we are operating under revised NRC processes, standards and regulations. In addition, many of the NRC staff involved in these processes have not been part of the initial licensing of a nuclear unit during their careers. Nevertheless, based on the quality of the AP1000 design, the strength of the AP1000 Design Certification and reference plant COLA, and the stated policy of the NRC to ensure that COL reviews are conducted in a timely, fair and procedurally logical manner, SCE&G believes that a COL for VCSNS Units 2 & 3 can be obtained in a timely fashion to support the construction schedule set forth in the EPC Contract. I would note, however, that a delay in obtaining a COL for the units would delay the start of nuclear safety related construction and is one of the principal schedule risks related to the project.

Q. WHAT ENGINEERING WORK WILL TAKE PLACE ON VCSNS UNITS 2 & 3 WHILE THE COLA REVIEW IS ONGOING?

A. Engineering work and limited design work will continue to take place on VCSNS Units 2 & 3 during the coming years and through much of the COLA review process. The NRC has approved the Westinghouse Design Certification Document for the AP1000 through Revision 15. Revision 16 to the AP1000 reflects improvements in the design and under consideration by the NRC at this time. These improvements can be incorporated in the VCSNS Units 2 & 3 COL when issued. Furthermore, Westinghouse may propose additional modifications to the AP1000 units during the time the COL is under review. If these AP1000 design modifications are adopted by the NRC, they may be incorporated into the COL for VCSNS Units 2 & 3 and their sister units.

There is nothing at all unusual about this engineering work and design modification review taking place at this stage of the project. All of this interim work is in accord with the regulations, processes and expectations of the NRC and is a normal part of the design, and engineering of major generating units. This is in keeping with standard industry practice and does not detract in any way from the fact that the AP1000 design is fully certified by the NRC.

Q. WHAT IS SCE&G'S ASSESSMENT OF THE AP1000 REFERENCE COLA AND THE LIKELIHOOD OF TIMELY APPROVAL?

A. As mentioned above, part of the process of SCE&G obtaining the COL for VCSNS Units 2 & 3 will involve the NRC issuing a COL for the AP1000 reference unit. The new nuclear deployment team, under my supervision and direction, has carefully reviewed the reference plan filing and all of the requirements and conditions that must be met for the AP1000 reference COLA presently pending before the NRC to be considered in a timely fashion and a COL to be issued. It is my opinion that the AP1000 reference plant COL can and in all likelihood will be issued in time for the approvals it contains to be incorporated in the SCE&G COL by reference. It is my opinion that this will happen in a way that will not delay either the issuance of the COL for VCSNS Units 2 & 3 or the completion of construction of the units under the schedule contained in Combined Application.

Q. WHAT OTHER PERMITS ARE REQUIRED FOR THE CONSTRUCTION OF VCSNS UNITS 2 & 3?

A. **Exhibit J, Chart B (Hearing Exhibit ___ (SAB-7))** to my testimony (Exhibit J to the Combined Application) contains a list of 19 major permits that will be required to for the construction and operation of VCSNS Units 2 & 3. This list includes such things as wetlands permits, FERC permits related to structures to be built on Lake Monticello, storm water permits related to site clearing, permits for the new wastewater treatment plant to be built as part of the projects, and other major permits.

The Company's witnesses Mr. Summer and Mr. Connor will discuss the substantive issues related to these permits in more detail.

Q. HOW ARE THESE OTHER PERMIT APPLICATIONS BEING HANDLED?

A. Over the coming years, SCE&G will apply for and obtain these other major permits as needed. As indicated above, engineering work and construction planning for the units is on-going and will be on-going throughout the early years of the construction process. In keeping with standard industry practice, SCE&G will apply for the permits required for various aspects of the work as the engineering and construction planning is finalized and as it becomes necessary to have permits in hand so that work can proceed. In many cases, it is inefficient to apply for permits significantly in advance of the work that requires them, since to do so would require the engineering or construction planning to be done out of sequence to support permitting. Since the details of the design or construction plan may change as the project proceeds, applying for permits early may result in permits that no longer conform to plans when the time comes to begin work under them.

Q. WHAT IS SCE&G'S ASSESSMENT OF ITS ABILITY TO OBTAIN THE PERMITS LISTED ON EXHIBIT J, CHART B IN A TIMELY WAY?

A. Again, the new nuclear deployment team, under my supervision and direction, has carefully reviewed and considered all the requirements and conditions that must be met to receive the permits listed on **Exhibit J, Chart B (SAB-7)** to my testimony (Exhibit J to the Combined Application) along with the other, less critical permits that may be required for various aspects of the construction work. Based on that review, it is my opinion that the SCE&G can obtain all required permits and do so within a time frame that will allow the Company and Westinghouse/Stone & Webster to construct the units within the construction schedules, with contingencies, submitted to this Commission in the Combined Application in this matter. It is also my opinion and that of the new nuclear deployment team, that VCSNS Units 2 & 3 can and will operate in compliance with all applicable laws and regulations.

Q. HOW WERE THE OWNER'S COSTS SHOWN ON EXHIBIT F TO THE COMBINED APPLICATION DETERMINED FOR THIS PROJECT?

A. The owner's costs listed on Exhibit F to the Combined Application were determined based on SCE&G's internal costs to date on the project, on the staffing plan for the new nuclear deployment team, on the cost information related to permitting which has been provided by Bechtel and by our internal environmental or other permitting experts and cost estimates as to other items as prepared by the new nuclear deployment team.

Q. ARE THE OWNER'S COSTS LISTED ON EXHIBIT F TO THE COMBINED APPLICATION A REASONABLE PROJECTION OF OWNER'S COSTS FOR THIS PROJECT?

A. Yes. In my opinion, the owner's costs listed on Exhibit F to the Combined Application, coupled with the contingencies and escalation listed in the Combined Application, are a reasonable projection of the owner's costs that can be expected for this project. The underlying cost projections are based on the same budgeting and cost project practices that the Company has used for years in operating its utility system and in preparing capital budgets in the ordinary course of its operations. The Company has extensive experience in the use of these budgeting techniques and they have been applied and refined in major construction projects it has undertaken in the past. Based on the information available today, I am confident in the reasonableness and accuracy of these forecasts with contingencies and escalation as appropriate cost projections for use in this proceeding.

Q. HOW WERE THE IN SERVICE EXPENSES FOR VCSNS UNITS 2 & 3 DETERMINED.

A. The in service expenses listed on Exhibit O to the Combined Application were estimated by members of SCANA's corporate planning group, with review and oversight from the new nuclear deployment team. They were derived as explained in Exhibit O.

Q. ARE THE IN SERVICE EXPENSES LISTED ON EXHIBIT O TO THE COMBINED APPLICATION A REASONABLE PROJECTION OF IN SERVICE EXPENSES FOR THIS PROJECT?

A. Yes. In my opinion, based on the information currently available, the in service expenses listed on Exhibit O to the Combined Application are a reasonable projection of the in service expenses that can be expected for VCSNS Units 2 & 3 when they go into operations. The underlying cost projections are based on budgeting and cost project practices that are consistent with the practices that the Company has used for years in operating its utility system and in preparing operating budgets for new and existing generating plants in the course of its operations. The projections related to decommissioning costs and waste disposal costs are reasonable and are based on the sorts of information generally relied upon in the industry to make such projections. Based on the information available today, I am confident in the reasonableness and accuracy of these forecasts as appropriate cost projections for use in this proceeding. As the Base Load Review Act provides, these forecasts will be updated in the months before the in service date of the units for purposes of the final revised rates filings for each of them.

SPENT FUEL AND DECOMMISSIONING

Q. HOW WILL SPENT FUEL FOR VCSNS UNITS 2 & 3 BE HANDLED?

A. Each fuel assembly will remain in the core for two or three 18-month operating cycles and then will be removed from the core and placed in the spent fuel pool. The spent fuel pool for each unit will be able to hold the spent fuel assemblies produced by 18 years of operation. In addition, SCE&G will construct a dry fuel storage facility at the Jenkinsville site. This facility will be used to store spent fuel from VCSNS Unit 1 beginning in 2015. That dry fuel storage facility will either be designed to accommodate spent fuel from VCSNS Units 2 & 3 from the outset, or will be designed so that it can be configured to do so when that storage is needed. My nuclear operation team has studied the issue extensively and foresees no problem in the design, permitting or construction of this dry fuel storage facility or in any future expansion of it to serve the needs of VCSNS Units 2 & 3.

Q. PLEASE DESCRIBE DRY FUEL STORAGE?

A. In dry fuel storage, spent fuel assemblies are placed in a heavy stainless steel vessel that is welded shut. The stainless steel vessel is then packed into a thick concrete container. The container provides full radiological and physical shielding for the spent fuel assemblies. The containers can be placed above ground on a pad, or placed below ground in silos or shafts. The heat from radioactive decay within the assemblies is small and dissipates naturally from convection. No mechanical systems or maintenance is required for dry fuel storage, and fuel assemblies can be maintained in such containers virtually indefinitely.

Q. IN YOUR OPINION, IS SPENT FUEL ASSEMBLY STORAGE OR DISPOSAL OR OTHER WASTE ISSUES A PROBLEM FOR VCSNS UNITS 2 & 3?

A. I have worked with these issues extensively over my career and with my nuclear operations team have studied waste disposal issues related to VCSNS Units 1, 2 & 3 in detail. In my opinion, spent fuel assembly storage and disposal and other radiological waste disposal are not a problem for the operations of VCSNS Units 2 & 3. There are fully sufficient and reliable means of handling spent fuel rods and other radiological waste from the plant. These means protect public health and safety and comply with all applicable regulatory requirements.

Q. IN YOUR OPINION, IS EVENTUAL DECOMMISSIONING OF THE UNITS A PROBLEM FOR VCSNS UNITS 2 & 3?

A. Again, I have worked with decommissioning issues extensively over my career and with my nuclear operations team have studied and considered decommissioning issues related to VCSNS Units 1, 2 & 3. There are fully safe, sufficient and reliable means of eventually decommissioning VCSNS Units 2 & 3 at the end of their useful lives in approximately 60 years. The available decommissioning means protect public health and safety and comply with all applicable regulatory requirements.

RISK FACTORS

Q. PLEASE EXPLAIN THE PRINCIPAL RISK FACTORS FOR THIS PROJECT AS YOU SEE THEM?

A. The risk factors for this project, as SCE&G currently understands them, are set forth in **Exhibit G (SAB-7)** to my testimony (Exhibit J to the Combined Application) which I would incorporate herein. These risk factors include various licensing and regulatory risks (some of which are discussed above), risks related to the engineering work that remains to be done on these units, procurement and transportation risks related to equipment and components for the units, construction risks, operational risks, financial and inflation risks, and disaster and weather related risks. All of these risk factors are discussed in detail in **Exhibit J,** and I would refer the Commission and the parties to that exhibit for a more detailed discussion of these factors. In addition, I would reiterate as stated in that exhibit that

> consideration of the risks associated with nuclear construction should be balanced by an appreciation of the factors that establish nuclear generation as the most prudent choice for meeting the growing energy needs of SCE&G's customers. Among those factors are the high cost of coal and new coal-fired capacity; the environmental concerns surrounding the construction of additional coal-fired generation; the uncertainty as to future costs or limitations imposed on CO_2 emissions; the uncertainty as to future natural gas prices and supplies; the relatively large amount of gas-fired generation already included in SCE&G's generation mix; the clear need for additional base load capacity, as opposed to intermediate gas-fired capacity, on SCE&G's system; the uncertainty as to the future costs and availability of AP1000 units or other nuclear units as the cost of alternative energy rises and global demand for these units increases; the value of special Federal tax incentives for those companies building nuclear units in the first phase of the present construction cycle; and other factors.

Exhibit J (SAB-7) at 1 of 12.

Q. WHAT IS THE COMPANY'S APPROACH TO MINIMIZING THOSE RISKS?

A. The steps that the Company has taken include all the matters set forth above related to the selection of the Jenkinsville site, the selection of AP1000 technology, the selection of Westinghouse/Stone & Webster as its contractor, the terms and price assurances contained in the EPC contracts, SCE&G's collaboration with other AP1000 utilities, and the financial matters about which the Company's CFO Mr. Addison will testify. In addition, to provide on-going construction monitoring, SCE&G will be expanding its new nuclear deployment team to create a construction oversight group whose responsibilities will parallel the Westinghouse/Stone & Webster construction organization and keep up with the progress and challenges of the construction process on a day-by-day basis.

CONSTRUCTION OVERSIGHT

Q. PLEASE EXPLAIN THE CONSTRUCTION OVERSIGHT PROCESS AND STRUCTURE THAT THE COMPANY WILL EMPLOY?

A. SCE&G is in the process of hiring additional engineering, licensing, construction, quality assurance, operations and accounting personnel to staff its new nuclear deployment team to support comprehensive oversight of project construction and administration of the EPC Contract. As construction ramps up, SCE&G will put in place an organization with individuals who will be charged with specific responsibility for liaison and oversight with each component of the organizational structure that Westinghouse/Stone & Webster is establishing for overseeing construction and administering the EPC Contract. In this way, SCE&G's organization to oversee Westinghouse/Stone & Webster's work on the project will mirror Westinghouse/Stone & Webster's organization. Ultimately, SCE&G anticipates having approximately more than 50 full-time and contract employees committed to the new nuclear deployment team. Their job will be to monitor each aspect of construction, to sit in on the construction meetings Westinghouse/Stone & Webster will conduct with its personnel and subcontractors, to participate in inspection and testing and acceptance protocols, and to review and monitor closely issues of cost, budget compliance and milestone progress.

Q. TO WHOM WILL THIS ORGANIZATION REPORT?

A. This organization will report to SCE&G's General Manager of New Nuclear Deployment. These individuals and their designees will meet as necessary, with the Project Directors for Westinghouse/Stone & Webster to review project status and schedule and will also meet with them monthly for in depth reviews of budget and payment issues. The project oversight team will issue written reports monthly to me, as Senior Vice President for Generation and Chief Nuclear Officer, and to the Executive Steering Committee for the Project which is comprised of the President of SCE&G and the Chief Operating Officer of Santee Cooper. The general manager of the team can escalate issues to this group at any time.

The Executive Steering Committee will meet with the project oversight team and other senior leaders from SCE&G and Santee Cooper at least quarterly to receive a full, in-person update on the progress of the project. This group can escalate issues to senior leadership of Westinghouse/Stone & Webster at any time and can escalate matters to the CEO and Chairman of SCANA and the Chief Executive Officer of Santee

Cooper at any time for resolution of issues at the comparable level within Westinghouse/Stone & Webster.

In addition, the Board of Directors of SCANA Corporation has an independent outside senior expert on nuclear generation issues who advises them as a consultant. As construction begins on VCSNS Units 2 & 3, the Board will provide independent monitoring and oversight of the progress of the construction project and administration of the EPC Contract as part of its regular duties.

Q. WHAT PROCESSES WILL SCE&G USE TO OVERSEE THE BUDGET FOR THE PROJECT?

A. Budgets for the VCSNS Units 2 & 3 project are being developed by SCE&G based on the price and payment provisions of the EPC Contract, as supplemented with owners' cost estimates based on its operations and project management staffing plan, all to include associated inflation and contingencies. The new nuclear deployment team will then track actual expenditures monthly as costs are charged to the project and as those charges are reported to it by SCANA accounting personnel. Financial meetings will be held at least monthly. Variances will be reviewed by the project oversight team at those meetings. Budget variance reporting will be an integral part of the reporting that is done monthly by the project oversight team to the Executive Steering Committee for the project, and that Committee may convene special meetings at any time to review budget variances of concern and may escalate concerns as set forth above.

Q. IN YOUR OPINION, IS SCE&G IMPLEMENTING A SUFFICIENT OVERSIGHT FUNCTION FOR THIS PROJECT?

A. Yes. The oversight function for this project is designed and staffed to ensure that the EPC Contract is administered as written and that SCE&G's interests as owner of the project are fully protected.

CONTINGENCIES

Q. WHAT PRICE CONTINGENCIES ARE CONTAINED IN EXHIBIT F TO THE COMBINED APPLICATION?

A. The Company's witness Ms. Best will testify concerning these price contingencies in more detail. A contingency percentage has been established for each pricing category under the EPC Contract, as well as for owners' costs and transmission costs. Those contingency percentages are then applied, as Ms. Best will testify, to the costs in each category and the resulting contingency amount is derived.

Q. HOW WERE THESE CONTINGENCY PERCENTAGES DETERMINED?

A. These contingency percentages were determined based on the engineering judgment of the new nuclear deployment team, and approved by me as the Senior Vice President of Generation and Chief Nuclear

Officer. They are based on SCE&G's assessment of the potential for actual costs to be greater than the forecasted costs based on such things as the necessity for change orders, delays due to weather, delays in receiving licenses and permits, actual inflation exceeding applicable indices, and estimates of the units of time and materials used to price the project that understate actual requirements. In my opinion, these risk factors are not subject to mathematical quantification, but must be assessed as a matter of sound engineering judgment. These contingency percentages were created in that way. I have reviewed them and can testify that in my opinion they are a sound and reasonable set of contingencies for use in forecasting the cost of this project.

Q. HOW WILL SCE&G ADMINISTER THOSE CONTINGENCIES?

A. In the Combined Application in this proceeding, SCE&G has asked for the right to apply the amounts stated as contingencies on Exhibit F of the Combined Application if and when needed during the course of the project.

Under the structure of Exhibit F to the Combined Application, unused contingency amounts carry over automatically. The annual cumulative project cost that SCE&G is proposing for the Commission to adopt is set forth as the Cumulative Project Cash Flow on Exhibit F, adjusted to reflect AFUDC or capitalized interest. Contingencies are fully reflected in these Cumulative Project Cash Flow figures. If contingencies do not materialize, those savings will be reflected in actual cumulative costs that are lower than the approved cumulative costs. Because the actual costs are cumulative, savings in any one year carry over to the next. This carryover is automatic and is justified because savings in one year may be simply a matter of timing, and the unrealized contingencies may come later.

However, it is possible that SCE&G may need to accelerate the recognition of contingencies if higher levels of contingencies are realized earlier in the construction schedule than anticipated. For that reason, SCE&G has asked in the Combined Application for the right to treat the total contingency for the project as a single pool of funds such that it can accelerate the contingency amounts to earlier years if needed. This would not change the overall cost of the project, but would allow for greater flexibility in administering the cumulative cash flow contingency if contingencies arise early in the construction process. If any contingency amounts are accelerated, they would be adjusted to account properly for any applicable inflation related to them.

Q. IN YOUR OPINION, IS THIS A REASONABLE REQUEST?

A. Yes, it is a reasonable request. Exhibit F of the Combined Application spreads the contingencies out as a uniform percentage of the cost to be spent in each year. Contingencies, however, are by definition unpredictable and are rarely experienced in a consistent year-by-year percentage. It is quite possible to have cost problems in early in a project, due to weather, permitting, unanticipated site conditions or other problems, which can be made up over the course of the project. Allowing the flexible use of contingencies is a reasonable response to such possibilities and the unpredictable nature of construction contingencies.

Q. WHAT SCHEDULE CONTINGENCIES ARE REQUESTED IN THE COMBINED APPLICATION?

A. In the Combined Application SCE&G is asking for a 30 month delay-related schedule contingency that would allow the Company to delay any of the milestones and substantial completion dates for the units by that amount of time. If this contingency were used, the associated capital cost payment schedules would be revised to reflect the new capital cost payment forecasts. Exhibit F would be revised to reflect new payment forecasts and associated escalation adjustments.

Q. HOW DID YOU ARRIVE AT THIS SCHEDULE CONTINGENCY?

A. Again, contingencies are by definition unpredictable. SCE&G's most significant schedule concern surrounds the issuance of a COL which is a prerequisite to Westinghouse/Stone & Webster being able to proceed with nuclear safety-related construction. Other schedule concerns would involve major components being lost in transit or delay due to catastrophes or disasters at the place of manufacture or plant site. A delay of up to 30 months, while highly unlikely, would not be inconceivable, and would not be likely to change SCE&G's commitment to complete the plant. Most importantly, SCE&G wants to be in a position to assure the financial community that even a delay of this size would not take away the cost recovery assurances provided by the Base Load Review Act.

Q. WHAT OTHER SCHEDULE CONTINGENCY IS CONTAINED IN THE COMBINED APPLICATION?

A. There is also a positive schedule contingency contained in the Combined Application. This contingency reflects the fact that it may be possible to accelerate some or all aspects of construction of the units if NRC licensing takes less time than expected, if weather and site conditions are more favorable than expected, if major components can be completed sooner than promised or if other circumstances permit. Anything that can be done to accelerate the schedule and increase the certainty of timely completion of the units will be a benefit to the Company and its customers. However, without a schedule contingency allowing the milestones, payments and cumulative allowed capital costs to be advanced, SCE&G could be in a position of exceeding the Cumulative Project Cash Flow on Exhibit F because the project was ahead of schedule. SCE&G is requesting the right to accelerate by up to 24 months the milestones, payments and capital costs contained in the Cumulative Project Cash Flow projections on Exhibit F, if the project or aspects of it move forward ahead of schedule. Moving forward ahead of schedule would be in the interest of everyone and this is a reasonable request to support that possibility.

CONCLUSION

Q. IN SUMMARY, WHAT ARE YOU ASKING THIS COMMISSION TO DO?

A. On behalf of SCE&G, I would ask the Commission to review the EPC Contract; the information concerning contractors, subcontractors and vendors; the information concerning the Jenkinsville site; the information concerning licensing and permitting of the units; the information concerning project risks; and the other matters discussed here. I would ask the Commission to conclude, as I believe, that VCSNS Units 2 & 3 are a prudent project and can reasonably be anticipated to be built at the prices and on the schedules set forth in the Combined Application.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does

LIST OF EXHIBITS
TO
DIRECT TESTIMONY OF STEPHEN A. BYRNE

DOCKET NO. 2008-196-E

EXHIBIT A (SAB-1)	**Description of the Westinghouse AP1000 and the Facilities** (Exhibit A of the Combined Application)
EXHIBIT B (SAB-2)	**Information Concerning Westinghouse Electric Company, LLC and Stone & Webster, Inc.** (Exhibit B of the Combined Application)
	Attachment A: NRC List of Active Reactor Projects
EXHIBIT C (SAB-3)	**Part One: Information Concerning the Engineering, Procurement and Construction Agreement ("EPC Contract")** (Exhibit C of the Combined Application)
(SAB-3-P)	**Part Three A: The Public Version of the EPC Contract (as redacted by Westinghouse/Stone & Webster).**
(SAB-3-C)	**Part Three B: The Confidential Version of the EPC Contract**
EXHIBIT D (SAB-4)	**Information Concerning Other Suppliers and Contractors** (Exhibit D of the Combined Application)
EXHIBIT E (SAB-5)	**Anticipated Construction Schedule** (Exhibit E of the Combined Application)
EXHIBIT I (SAB-6)	**Inflation Indices** (Exhibit I of the Combined Application)
EXHIBIT J (SAB-7)	**Risk Factors Related to Construction and Operation of the Facilities** (Exhibit J of the Combined Application)

EXHIBIT A

DESCRIPTION OF THE WESTINGHOUSE AP1000 AND THE FACILITY

Combined Application of South Carolina Electric & Gas Company for a Certificate of Environmental Compatibility and Public Convenience and Necessity and for a Base Load Review Order
Public Service Commission Docket No. 2008-196-E

1. INTRODUCTION

This **Exhibit A** provides information concerning the location and selection of the location for the proposed Virgil C. Summer Nuclear Station (VCSNS) Units 2 & 3 and a description of the Units SCE&G proposes to build.

2. SITE LOCATION AND FACILITY DESCRIPTION

The proposed AP1000 Advanced Passive Safety Power Plants (AP1000), referred to as VCSNS Units 2 & 3, are to be located approximately one mile south-southwest from VCSNS Unit 1. VCSNS Unit 1 is located at the southern end of the Monticello Reservoir in Fairfield County, South Carolina; approximately 15 miles west of Winnsboro and 26 miles northwest of Columbia, as shown on Figure 3. The site has a 44 year history of nuclear power generation. The Parr Experimental Nuclear Plant, which was the first commercial nuclear generation station in the Southeast, went into commercial operation on part of the site in May of 1964. This plant has since been retired and is in the final stages of decommissioning.

VCSNS Unit 1, which went into commercial operation on January 1, 1984, is a Westinghouse pressurized water reactor plant licensed by the Nuclear Regulatory Commission (NRC) in 1982 and has been in commercial operation since 1984. The site is in a sparsely populated rural area. The nearest community is Jenkinsville, South Carolina, located approximately three miles southeast of the site. The Broad River is located approximately one mile west of the site and flows in a southerly direction, as shown on Figure 4. The north-south oriented Monticello Reservoir has an area of approximately 6,800 acres (6 miles long and 2.5 miles across). The 6,800 acres includes the 300 acre Monticello sub-impoundment recreation lake. The power plant footprints of Units 2 and 3 consist of an area of approximately 47 acres, as shown on Figure 5.

The proposed AP1000 units and support facilities for the VCSNS site are designed around the Westinghouse standardized unit approach. Each AP1000 unit consists of five principle generation structures—the nuclear island, turbine building, annex building, diesel generator building, and a radwaste building, as shown on Figure 6. Structures that make up the nuclear island include the containment, shield building, and auxiliary building. The containment is a freestanding steel containment vessel with elliptical upper and lower heads. It is surrounded by the shield building. The shield building is a reinforced concrete structure that, in conjunction with the internal structures of the containment, provides the required shielding for the reactor coolant system and other radioactive systems and components housed in the containment. The shield building roof is a reinforced concrete conical structure. The auxiliary building is a reinforced concrete structure and shares a common base mat with the containment building and the shield building. The auxiliary building wraps around approximately 70% of the circumference of the shield building and provides protection and separation for the safety-related mechanical and electrical equipment located outside the containment.

The turbine building is a rectangular metal-sided building with its long axis oriented radially from the containment. The turbine building houses the turbine, generator, and associated mechanical and electrical systems. The annex building is a combination reinforced concrete structure and steel framed structure with insulated metal siding. The annex building provides the main personnel entrance to the power block. The building also contains the control support area, a machine shop, the ancillary diesel generators, other electrical equipment and various heating, ventilation, and air conditioning systems. The plant includes non-safety related diesel generators and a diesel generator building is a single-story steel-framed structure with insulated metal siding. The building houses two diesel generators to provide backup power in the event of disruption of the normal power source. The radwaste building is a steel-framed structure that houses low-level liquid radwaste holdup tanks and processing system.

The circulating water system for each unit consists of two mechanical draft cooling towers and a circulating water pump intake structure. The circulating water system cooling towers are located south of the proposed new units. Each cooling tower has a concrete shell with fan stacks on top rising to a height of approximately 70 feet. Internal construction materials include fiberglass-reinforced plastic or polyvinyl chloride for piping laterals, polypropylene for spray nozzles, and polyvinyl chloride for fill material. Mechanical draft towers use mechanical fans to generate air flow across sprayed water to reject heat to the atmosphere. The four cooling towers occupy an area of approximately 38 acres.

In addition to the circulating water system cooling tower footprint, VCSNS Units 2 & 3 require space for service water system cooling towers (one per unit). These mechanical draft cooling towers require an area of approximately 0.5 acre per unit and are located near the turbine building. The proposed new units share common intake structures, discharge structure, and certain support structures such as office buildings, water treatment, and waste handling facilities.

The Monticello Reservoir is used as makeup water for the circulating water and service water cooling systems. The plant discharge is to the Parr Reservoir. The new intake structure for the circulating water system makeup is located approximately 1,250 feet west of the VCSNS Unit 1 intake facilities. An additional intake structure for the remaining plant water (service water cooling makeup, potable water, fire water, demineralized water supply) is located approximately 5500 feet east of the VCSNS Unit 1 intake facilities. Modifications to existing infrastructure will be made to integrate VCSNS Units 2 and 3 with the existing unit; however, none of the existing unit's structures or facilities that directly support power generation are shared. A new security perimeter will be installed to encompass the new units. The existing Nuclear Learning Center will be expanded to support the training needs for the new units. Existing administrative buildings, warehouses, and other support facilities will be used, expanded, or replaced based on prudent economic and operational considerations.

After the completion of new unit construction, areas used for construction support are to be graded, landscaped, and planted to enhance the overall site appearance. Previously forested areas cleared for temporary construction facilities are to be revegetated, and harsh topographical features created during construction are to be contoured to match the surrounding areas. These areas include equipment laydown yards, module fabrication areas, concrete batch plant, areas around completed structures, and construction parking.

VCSNS Unit 1 interconnects with the regional power grid via 10 existing 230kV transmission lines. To connect the additional generation to the electric grid, SCE&G will construct six new 230kV transmission lines: three for VCSNS Unit 2 and three for VCSNS Unit 3. A new 230kV switchyard will be constructed approximately 1,000 feet northwest of VCSNS Units 2 and 3, and 4,000 feet west south west of the existing Unit 1 site. This new switchyard will be air-insulated and consist of ten bays in a breaker-and-a-half arrangement. It will be located within an area approximately 2,000 feet long, 600 feet wide and occupy about 28 acres.

A Description of the Westinghouse AP1000

Design Overview – The AP1000 design is derived directly from the AP600, a two-loop, 600 MWe Pressurized Water Reactor (PWR). In December 1999, the AP600 was granted design certification from the Nuclear Regulatory Commission (NRC). The AP600 was the first nuclear reactor design using passive safety technology licensed in the West or in Asia. However, Westinghouse determined that a 600 MWe unit was not cost competitive in US markets. Therefore, Westinghouse embarked on the development of the AP1000 design, which applies economies of scale to the AP600 design to reduce the cost per kW while maintaining the passive safety advantages established by the AP600. At present, approximately eight to twelve AP1000 units are proposed to be built in the United States, most of which are planned to be located in the Southeastern United States.

Like the AP600, the AP1000 utilizes passive safety features that, once actuated, depend on natural forces, such as gravity, condensation and natural circulation, to perform required safety functions. These passive safety systems result in increased plant safety and have also significantly simplified plant systems, equipment and plant operation and maintenance. In both the AP600 and AP1000 designs, there are 60 percent fewer valves, 75 percent less piping, 80 percent less control cable, 35 percent fewer pumps, and 50 percent less seismic building volume than in a conventional reactor. This greatly simplified design complies with all of the NRC regulatory and safety requirements and EPRI Advanced Light Water Reactor Utility Requirements Document. These features make this design easier and less expensive to build, operate, and maintain.

The AP1000 was design certified by the NRC under 10 CFR 52, Appendix D in 2004. It was also found to meet the U.S. NRC deterministic-safety and probabilistic-risk criteria with large margins. The results of the Probabilistic Risk Assessment (PRA) for the AP1000 design show a very low core damage frequency, *i.e.*, the probability of an accident that would result in core damage. The Nuclear Regulatory Commission requires that plants be designed such that the risk of core damage resulting from an emergency will occur 1 time or less in a 10,000 year period. The AP1000 is designed to have a core damage probability of 1 or less in every 2,500,000 years.

With the AP600 design certified by the NRC as a starting point, a minimum number of changes were made to realize a significant increase in power in AP1000. The reactor vessel for the AP1000 is the same diameter as for the AP600, but the number of fuel assemblies is only minimally increased from 145 to 157 and the height of the core was increased from 12 feet to 14 feet. In addition, to increase the output of the reactor, reactor coolant pumps and steam generators have been increased in size. The design of these larger reactor components are based on components that are used in operating PWRs or have been developed and tested for new PWRs. In order to maintain adequate safety margins, the capacity of the passive safety features have been selectively increased based on insights from the AP600 test and analysis results. As a result, more than 90 percent of the design for the plant had already been completed and more than 80 percent of the AP600 Safety Analysis Report remained unchanged for the AP1000. A pre-certification review phase was completed in March 2002 and was successful in establishing the applicability of the AP600 test program and AP600 safety analysis codes to the AP1000 design certification.

Electrical and Thermal Output – The AP1000 has a net electric output based a current engineering capabilities of 1,117MWe, reactor power (thermal) of 3,400 MWth. Its Fuel Type is 4.95% enriched UO2. Major components include a single reactor pressure vessel, two steam generators, and four reactor coolant pumps for converting reactor thermal energy into steam. A single high-pressure turbine and three low-pressure turbines drive a single electric generator.

Detailed Description of the Components and Operations of the Unit – The AP1000 reactor is connected to two steam generators via two primary hot leg pipes and four primary cold leg pipes. A reactor coolant pump is located in each primary cold leg pipe to circulate pressurized reactor coolant water through the reactor core. The reactor coolant pumps circulate reactor coolant through the reactor core making contact with the fuel rods which contain the enriched uranium dioxide fuel. As the reactor coolant passes through the reactor core, heat from the nuclear fission process is removed from the reactor. This heat is transported to the steam generators by the circulating reactor coolant and passes through the tubes of the steam generators to heat the feedwater from the secondary system. The reactor coolant is then returned to the reactor by the reactor coolant pumps, where it is reheated to start the heat transfer cycle over again. Inside the steam generators, the reactor heat from the primary system is transferred through the walls of the tubes to convert the incoming feedwater from the secondary system into steam. The steam is transported from the steam generators by main steam piping to drive the high-pressure and low-pressure turbines connected to an electric generator to produce electricity. The turbine is an 1,800-rpm, tandem-compound, six-flow, reheat unit. The high-pressure turbine element includes one double-flow, high-pressure turbine. The low-pressure turbine elements include three double-flow, low-pressure turbines. The turbine generator system will be manufactured by Toshiba. After passing through the high and low pressure turbines, the steam is condensed back to water by cooled water circulated inside the titanium tubes located in the three condensers. The condensate is then preheated and pumped back to the steam generators as feedwater to repeat the steam cycle. The condenser is a three-shell, single-pass, multi-pressure unit. The unit thermal efficiency of the complete cycle is approximately 35%.

The AP1000 pressurized water reactor works on the simple concept that, in the event of a design-basis accident (such as a coolant pipe break), the plant is designed to achieve and maintain safe shutdown condition without any operator action and without the need for AC power or pumps. The AP1000 passive safety systems require no operator actions to mitigate design-basis accidents. These systems use natural forces such as gravity, natural circulation, evaporation, condensation and compressed gas to achieve their safety function. No pumps, fans, diesels, chillers, or other active machinery are used, except for a few simple valves that automatically align and actuate the passive safety systems. To provide high reliability, these valves are designed to move to their safeguard positions upon loss of power or upon receipt of a safeguards actuation signal. Only a single move is required for each valve, which is powered by multiple, reliable Class 1E DC power batteries. The passive safety systems do not require the large network of active safety support systems (ac power, diesels, HVAC, pumped cooling water) that are needed in typical nuclear plants. As a result, in the case of the AP1000, active support systems no longer are considered to be "safety related", and they are either simplified or eliminated. With less safety-related equipment, the seismic Category 1 building volumes needed to house safety-related equipment are greatly reduced. In fact, most of the safety equipment can now be located within containment, resulting in fewer containment penetrations.

Many active components are included in the AP1000, but are designated as non safety-related. Multiple levels of defense for accident mitigation are provided, resulting in extremely low core-damage probabilities while minimizing occurrences of containment flooding, pressurization and heat-up.

3. SITE SELECTION

SCE&G conducted the site selection study for one or more possible new nuclear units in 2005. In that study, SCE&G reviewed the evaluations that had already been performed on a number of potential power plant sites in its service territory. Those evaluations included the evaluation conducted in originally selecting the location of the VCSNS Unit 1, the evaluation for possible sites for a second unit, and several subsequent site evaluation studies related to the possible siting of additional fossil-fueled plants.

SCE&G added one additional site, the Savannah River Site (SRS), to this list of previously studied sites for evaluation in 2005. SRS was identified as a potential site since it was within SCE&G service territory and had been evaluated as a potential nuclear site in recent industry studies by third parties (including a study conducted by NuStart Energy Development, LLC ("NuStart") an association of utilities considering constructing nuclear construction.

A siting study conducted by Dames & Moore in 1974 had evaluated 18 potential nuclear power plant sites located across the SCE&G service territory as possible sites for a second nuclear power plant in addition to VCSNS Unit 1. The findings of that study indicated that several potential locations within SCE&G's service territory were suitable for such a unit. In 2005, SCE&G revaluated these sites based on the results of the earlier study. Based on the 2005 evaluation, SCE&G determined that none of these 18 sites were "obviously superior" to VCSNS as sites for a new nuclear plant, especially considering:

- VCSNS' status as an existing nuclear power plant site, the extensive nuclear-related infrastructure and personnel already present on the site, as well as SCE&G's 25 years of experience in nuclear operations at that location;

- The availability on the VCSNS site of adequate land and water for construction of new units;
- The availability of existing transportation and transmission infrastructure on the VCSNS site; and
- The VCSNS site's favorable location with respect to SCE&G loads.

SCE&G had commissioned additional site selection studies in the 1980s (Dames & Moore 1982, 1988) to identify sites for potential future fossil-fueled power plants. Not all criteria used for fossil plant siting studies are directly applicable to nuclear plants. Nonetheless, these studies consistently identified sites at VCSNS as being among the most preferable of the sites they evaluated for the construction of a new, base load generating unit to serve SCE&G's system.

Based on the conclusion that no previously evaluated sites were "obviously superior" to VCSNS, the 2005 siting study focused on comparing VCSNS to the previously unevaluated SRS site. This aspect of the evaluation was conducted in accordance with the overall process outlined in the Electric Power Research Institute (EPRI) Technical Report TR-1006878, Siting Guide: Site Selection and Evaluation Criteria for an Early Site Permit Application (Siting Guide), March 2002. The technical evaluation for this study was conducted by Dr. Kyle Turner (McCallum-Turner) who was also the principal investigator for development of the EPRI Siting Guide. This process, as adapted for the SCE&G site selection study, is depicted in Figure 1 below.

Screening-level criteria developed from the EPRI Existing Site Criteria were applied to the evaluation of the two sites. Once these initial screening-level evaluations were developed, reconnaissance-level on-site visits were conducted to support the site selection analysis.

Using all available data (including reconnaissance data) and criteria developed based on the EPRI general site criteria, detailed site suitability evaluations of the two alternative sites were conducted and overall composite site suitability ratings were developed.

The VCSNS site was found to rate higher in the railroad access, transmission access, and seismic criteria; the two sites were rated essentially equal in the remaining criteria (Ref. Table 1). Overall, based on the screening-level composite evaluation, VCSNS was found to be a superior location for the SCE&G COL application (Ref. Figure 2). Environmental and geological information concerning the site is summarized on **Exhibit P** to this Application.

Figure 1: Site Selection Process Overview

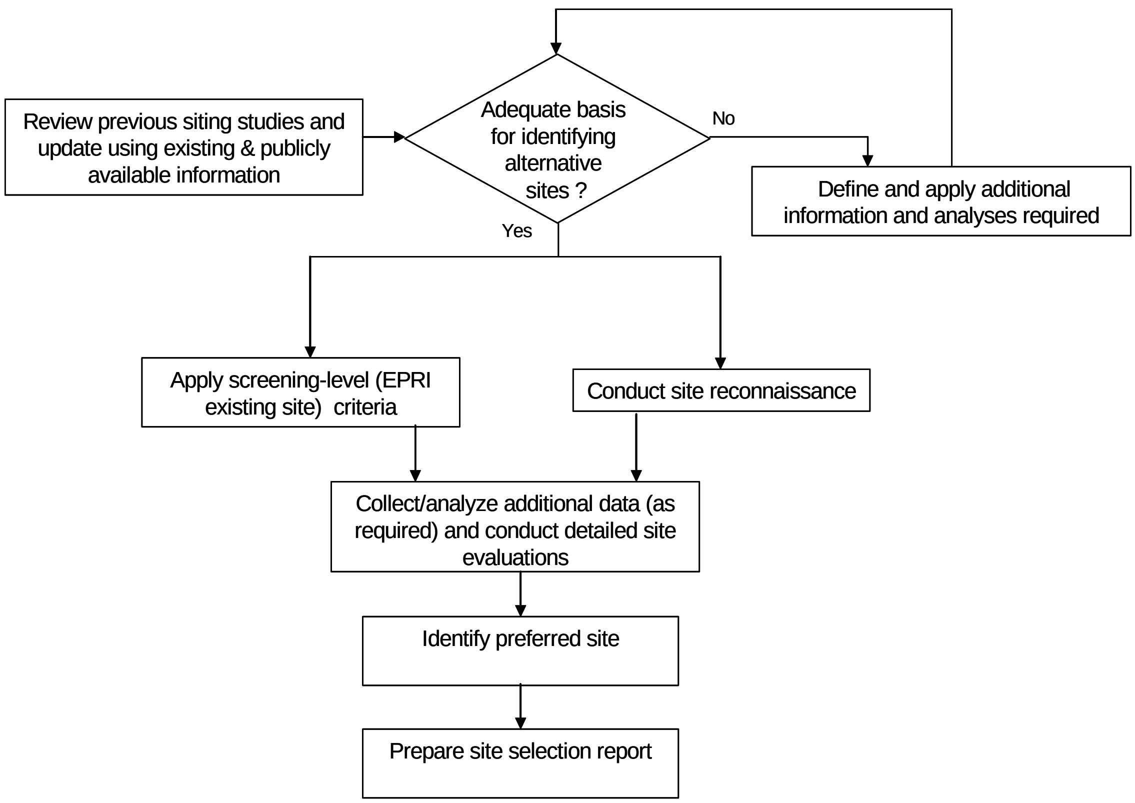


Table 1: Screening Evaluation Ratings

	Criterion										
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	Composite Site Rating
	Cooling Water Supply	Flooding	Population	Hazardous Land Uses	Ecology	Wetlands	Railroad Access	Transmission Access	Geology & Seismic	Land Acquisition	
	Weight Factor										
Potential Site Name	9.8	4.4	8.6	5.9	5.6	5.6	6.7	7.4	9.8	6.3	
	Site Ratings										
SRS	3.5	5	4	4	4	4	4.79	1.00	2	4.5	**246.6**
VCSNS	4	5	4	4	4	4	4.96	4.94	3	5	**294.7**

Screening Criteria

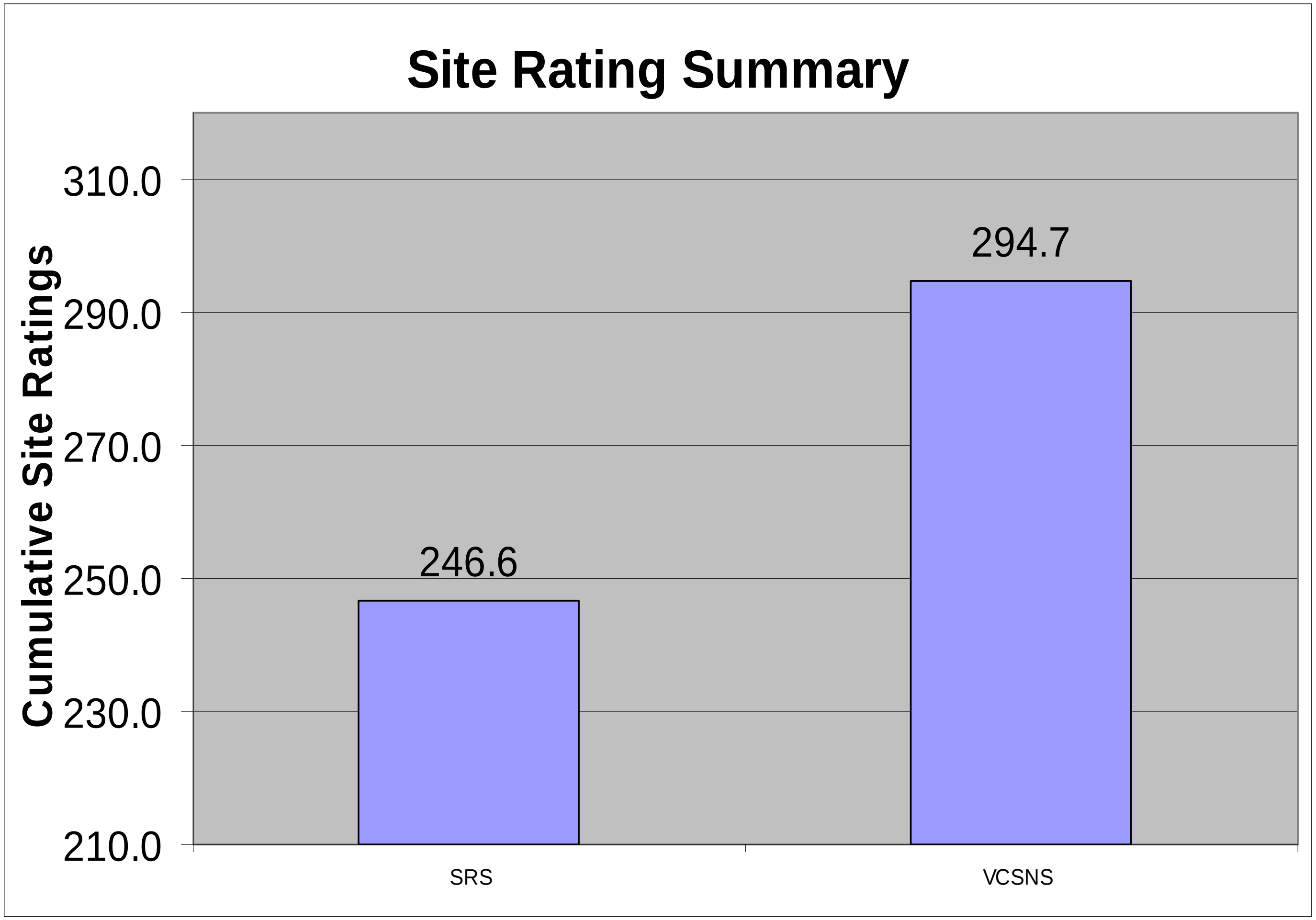
Criteria presented in Table 1, were derived from the existing site criteria listed in Section 4.2 of the EPRI Siting Guide: Site Selection and Evaluation Criteria for an Early Site Permit Application (Siting Guide), March 2002. They were intended to provide insights into the overall site suitability trade-offs between the two sites and to take advantage of data available during the site selection process.

Criterion Ratings – Each site was assigned a rating of 1 to 5 (1 = least suitable, 5 = most suitable) for each of the potential site evaluation criteria. Information sources for these evaluations included publicly available data, information available from SCE&G files and personnel, site visits, and large scale satellite photographs.

Weight Factors – Weight factors reflecting the relative importance of these criteria were synthesized from those developed for previous nuclear power plant siting studies. The weight factors were originally derived using methodology consistent with the modified Delphi process specified in the Siting Guide. Weight factors used (1 = least important, 10 = most important) are listed in the table below.

Composite Suitability Ratings – Ratings reflecting the overall suitability of each site were developed by multiplying criterion ratings by the criterion weight factors and summing over all criteria for each site.

Figure 2: Screening Evaluation Composite Site Suitability Ratings



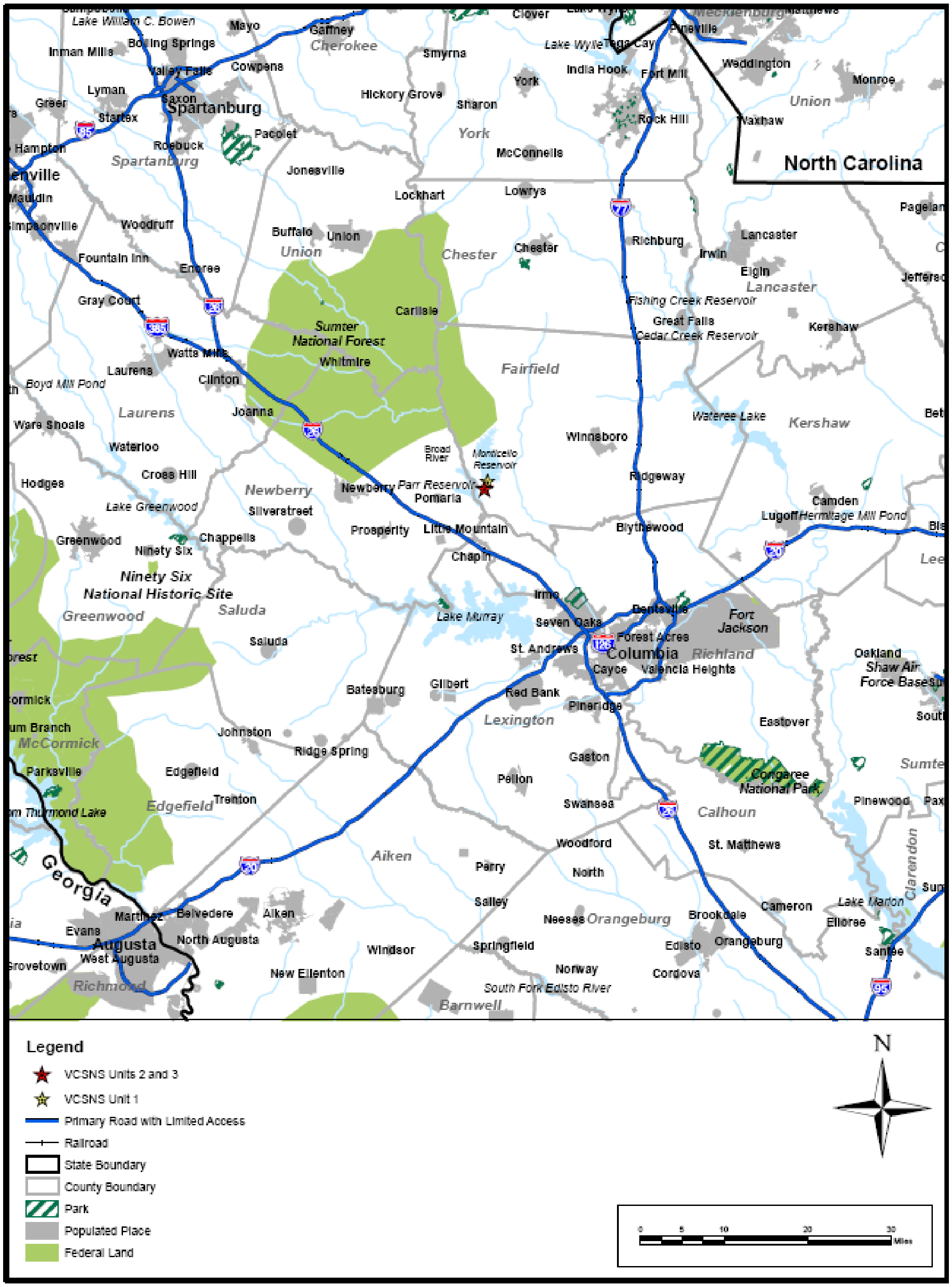


Figure 3: 50 mile radius

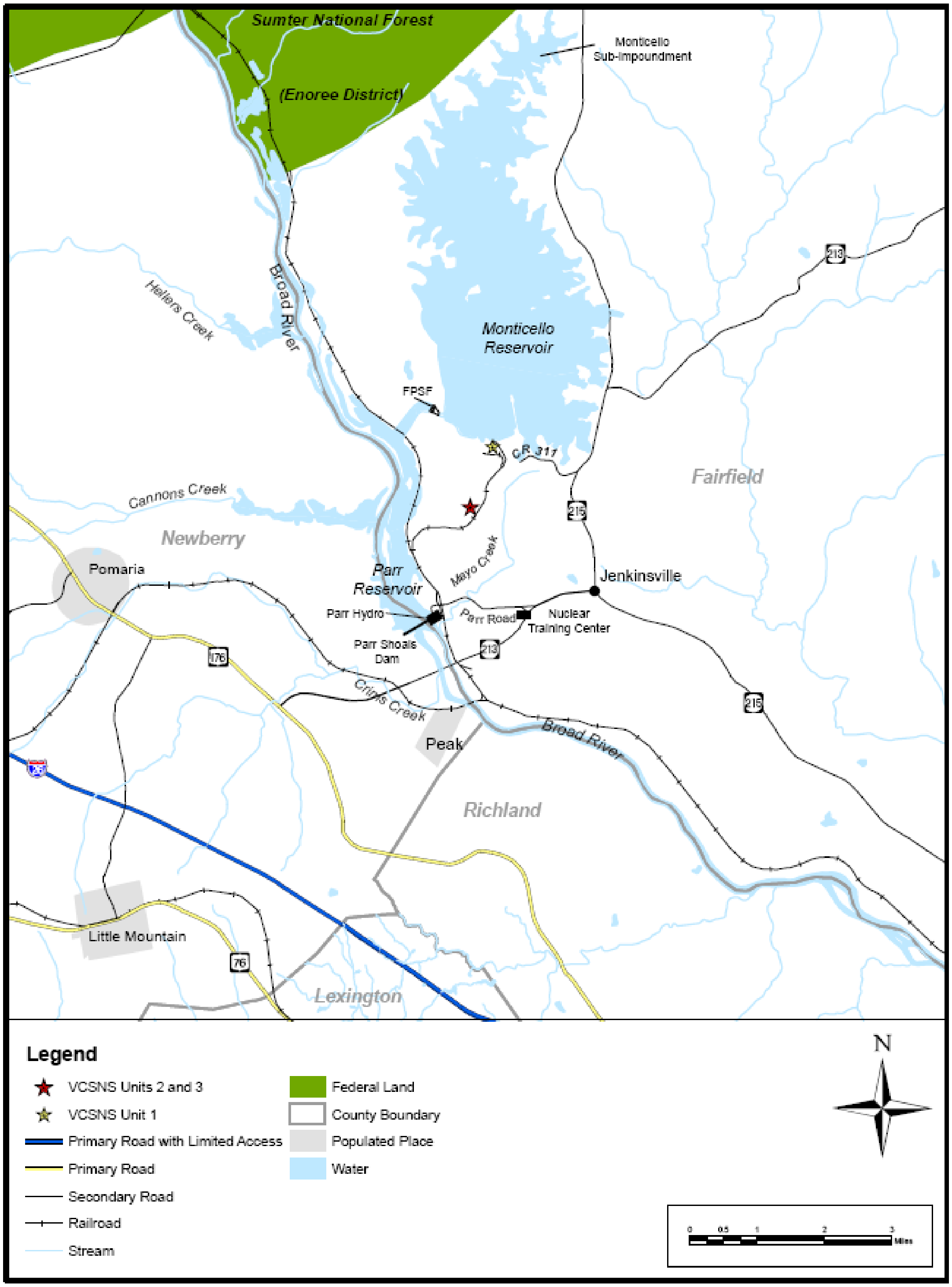


Figure 4: 6 mile radius

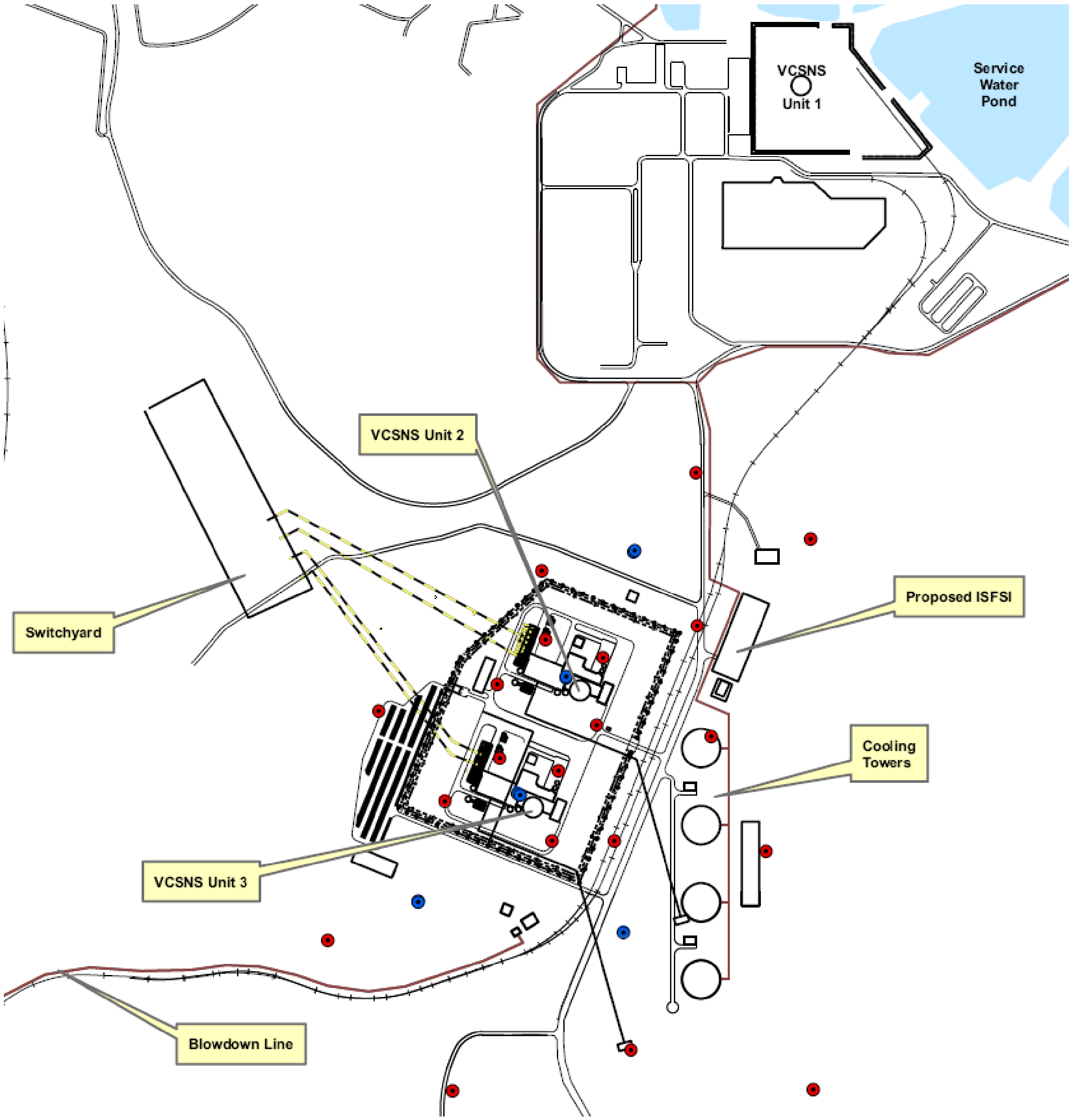


Figure 5: Site Layout

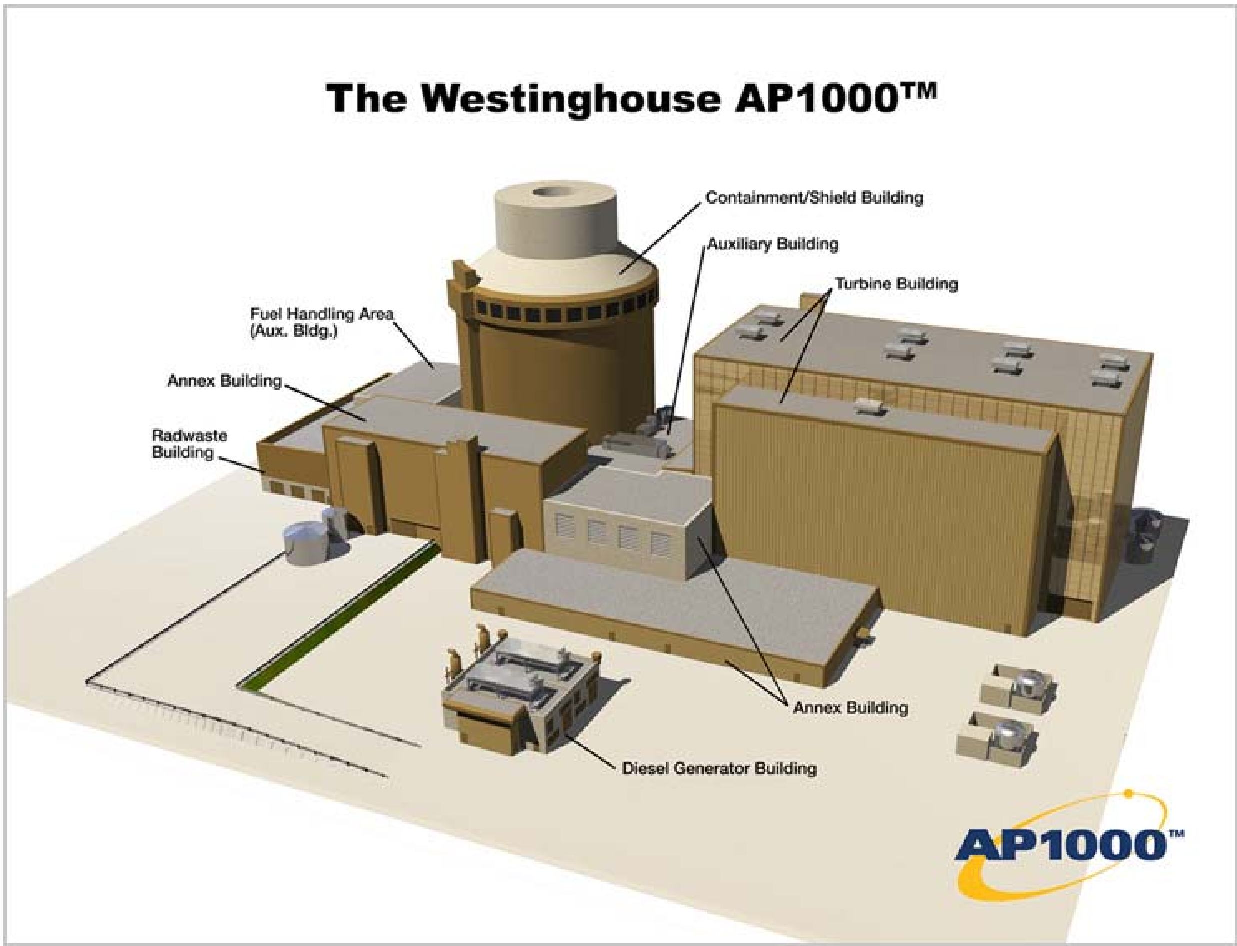


Figure 6: AP1000 Standard Plant Layout

EXHIBIT B

INFORMATION CONCERNING WESTINGHOUSE ELECTRIC COMPANY, LLC AND STONE & WEBSTER, INC.

Combined Application of South Carolina Electric & Gas Company for a Certificate of Environmental Compatibility and Public Convenience and Necessity and for a Base Load Review Order
Public Service Commission Docket No. 2008-196-E

1. INTRODUCTION

This exhibit provides an overview of the terms of the qualifications of the members of the consortium of Westinghouse Electric Company, LLC and Stone & Webster, Inc., which will undertake to supply two Westinghouse AP1000 Advanced Passive Safety Power Plants (AP1000) units to be constructed as the as V. C. Summer Nuclear Station (VCSNS) Units 2 & 3 (the Units or the Facilities).

2. QUALIFICATIONS OF WESTINGHOUSE AND STONE & WEBSTER

South Carolina Electric & Gas Company (SCE&G) has signed an Engineering, Procurement and Construction Agreement (EPC Contract) with consortium of Westinghouse Electric Company, LLC (Westinghouse) and Stone & Webster, Inc. (Stone & Webster) to construct two AP1000 units in Jenkinsville, South Carolina. Westinghouse, a group company of Toshiba Corporation, is the world's pioneering nuclear power company and is a leading international supplier of nuclear plant products and technologies to utilities. Westinghouse supplied the world's first pressurized water reactor (PWR) in 1957 in Shippingport, Pennsylvania. and supplied the Parr Experimental Nuclear Plant reactor which SCE&G and a consortium of other Southeastern utilities operate adjacent to the VCSNS site in the mid-1960s. Today, Westinghouse technology is the basis for approximately one-half of the world's operating nuclear plants, including 60 percent of those in the United States. In addition, the Westinghouse AP1000 PWR technology has held design certification from the U.S. Nuclear Regulatory Commission (NRC) since 2004.

Stone & Webster, a wholly owned subsidiary of the Shaw Group, Inc. (Shaw), designed and constructed the first commercial reactor at Shippingport, Pennsylvania, and was integral in the licensing, design, engineering, and construction of numerous commercial nuclear power plants including Beaver Valley, Fitzpatrick, Nine Mile Point, North Anna, Maine Yankee, Shoreham, Surry, Millstone, and River Bend. Stone & Webster also participated in construction of the Parr Experimental Nuclear Plant.

A Fortune 500 company with nearly $6 billion in annual revenues, Shaw is headquartered in Baton Rouge, Louisiana, and employs approximately 27,000 people at its offices and operations in North America, South America, Europe, the Middle East and the Asia-Pacific region. Westinghouse and Shaw have worked together over the past two and a half years in a teaming arrangement to develop a complete AP1000 Nuclear Plant standard "package" approach which is being offered to the utility industry. Both companies have made substantial, internally funded financial and technical investments in the engineering and design, construction sequence and modularization planning of the AP1000 Nuclear Plant. In addition, Westinghouse is providing the design of the nuclear steam supply systems for four AP1000 units to be built in China, and both Westinghouse and Stone & Webster have signed an EPC Contract to build two units for Southern Company outside of Augusta, Georgia.

The purchase of Westinghouse by Toshiba Corporation and Shaw was completed in 2006. Toshiba Corporation is the majority owner and Shaw holds a 20% interest. Toshiba America, Inc. (TAI) is the holding company for one of the nation's leading group of advanced technology companies, with approximately 8,000 employees in the U.S. Toshiba Corporation is a multinational conglomerate manufacturing company, headquartered in Tokyo, Japan. The company's businesses are in high technology, electrical engineering and electronics fields. The company is the world's ninth largest integrated manufacturer of electric and electronic equipment, with some 161,000 employees worldwide and consolidated annual sales of over US$53 billion. This consortium of companies provides a teaming agreement that offers utilities combined engineering, design, procurement, and construction services through a single entity for building an AP1000 Nuclear Power Plant.

The Westinghouse/Stone & Webster team has developed a detailed implementation plan and infrastructure for implementing AP1000 projects. A joint implementation plan, integrated EPC schedule and cost estimate have been developed. Stone & Webster has participated in the design of the “modular” construction approach with Westinghouse over the past several years and together the team has developed the processes and procedures for modular construction of AP1000 plants. Using this method, sections of the plant are fabricated in centralized manufacturing facilities remote to the site and transported to the site for final assembly. Modular assembly is a key means that will be employed to reduce the construction cost and optimize the construction schedule for VCSNS Units 2 & 3.

3. BASIS FOR SELECTING WESTINGHOUSE AND STONE & WEBSTER

Both technical and financial evaluations of new nuclear technologies, performed initially in 2005 and again in 2007, resulted in and confirmed the selection of the Westinghouse AP1000 design as the preferred technology for VCSNS Units 2 & 3. The evaluations were conducted as a structured process, assessing various attributes of the reviewed technologies for the reactor power plant consortiums. The technical evaluation appraised attributes in ten key areas weighted as follows: Cost Escalation Risk 20%, Ability to Meet Schedule/Commercial Operation Date 15%, Design Features/Technology 15%, Licensing 15%, Confidence in Ability to Execute 10%, Security 5%, Engineering Completeness 5%, Supply Chain 5%, Construction/Testing Duration 5%, Fleet Collaboration 5%. The cost evaluation criteria were Projected Operations & Maintenance Cost $/MWh, and Overnight Construction Cost $/KWe. Both the technical and financial evaluations indicated the AP1000 technology to be the preferred choice.

Reactor technologies and vendors evaluated were the: 1) Westinghouse - AP1000, 2) General Electric - Economic Simplified Boiling Water Reactor (ESBWR), and 3)

UniStar/AREVA - Evolutionary Power Reactor (EPR). The AP1000 and ESBWR are passive safety designs with the EPR being an active safety design. The AP1000 had significant strengths in the key attributes of:

Licensing

Under the procedures laid out in 10CFR Part 52 by the NRC, the first step for licensing of new nuclear technologies is the issuance of a Final Design Approval, which constitutes an approval of the design of the principal systems for a type of unit. At the time of selection, out of the ESBWR, EPR and AP1000 technologies, only the AP1000 had received NRC Final Design Approval. The AP1000 Safety Evaluation Report and the Final Design Approval provided the NRC's basis for concluding the AP1000 meets all of the applicable regulatory requirements and can be referenced by an applicant for a Combined Operating License (COL). At the time of selection, the ESBWR was in review by the NRC for Final Design Approval and the EPR technology had yet to be submitted to the NRC for Final Design Approval.

The second stage in the NRC review and licensing process is the licensing of a specific plant, including all systems, facilities and processes, through the COL process. The NRC expressed a preference that the potential owners and designer of each reactor technology collaborate in the filing of a lead reference plant COL Application (COLA), which is the Bellefonte Units No. 3 & No. 4 for the AP1000 technology. For follow-on power plants of like technology, the NRC will allow reference to the standard sections of the reference plant COLA. The NRC would then only have to review site specific deviations from the reference plant COLA. The utilization of a reference plant COLA minimizes multiple NRC reviews of the same material, thus more effectively utilizing resources and optimizing the review schedule without degradation of the quality of the safety review.

The COLA for the TVA Bellefonte Units 3 & 4 (AP1000 Reference Plant) was submitted for NRC review on October 30, 2007. Through its participation in NuStart Development, LLC, SCE&G and other entities considering building AP1000 units are assisting in coordinating the AP1000 Reference Plant licensing.

Ability to Meet the Desired Schedule/Commercial Operation Date

The Westinghouse/Stone & Webster consortium contractually committed to the 2016 Commercial Operation Date for VCSNS Unit 2. The AP1000 Design Control Document having received NRC Final Design Approval for reference in the COLA minimizes risk of issues arising during NRC COLA review that would negatively impact the 2016 commercial operation date schedule.

Cost

The construction and operation of two AP1000 nuclear power plants was calculated to have the lowest capital cost $/KWe was evaluated to be competitive with the other reactor technologies on long term Operations & Maintenance cost $/MWe, and was determined to be the best site utilization for MWe (two medium sized units vs. one large unit). Considering licensing and design status along with industry/utility collaborative effort/support, the AP1000 was judged to be the best technology for cost containment during design and construction.

Collaboration Opportunities

Given the knowledge of industry activities and direction, including NuStart and the regional utilities with which SCE&G has long standing cooperative relationships, the greatest opportunity for collaboration from initial licensing activities through long term operation of the stations is with the AP1000 technology. It is likely that a number of AP1000 units will be built in the Southeast which will maximize the benefits of potential collaborative efforts.

Technology Preferences

The Pressurized Water Reactor technology was favored over the Boiling Water Reactor technology because of the knowledge base and experience at the current operating V. C. Summer Nuclear Station. Additionally, the synergistic effects achievable at a multiple unit station will be maximized by use of similar and familiar technologies.

As discussed in **Exhibit A**, above, the AP1000 provides dramatic simplifications in the plant design which has been achieved with the use of passive safety features. With the passive safety design, there are significantly fewer pumps, valves, and piping; therefore, regulatory programs, inspection requirements, maintenance programs, and procurement can be correspondingly simplified. The smaller, simpler, designs with significantly fewer components provide a clear advantage over active plant designs in regard to long term Operations & Maintenance considerations.

The AP1000 power output of 1117MWe is optimally sized to match the Company's projected load growth profile. It minimizes excess reserve margin and allows for the optimized addition of a second unit in sequence with the first to match system load growth. In addition, the interruption of power from a single unit of a twin AP1000 configuration would have a less dramatic impact on the Company's generation capacity and transmission grid stability than would the interruption of power from a single unit of roughly twice the size.

Based on results of the initial 2005 reactor vendor evaluation and the review of that evaluation performed in 2007, SCE&G determined that the AP1000 power plant technology supplied through the Westinghouse/Stone & Webster consortium was the preferred option to meet its need for new nuclear generation.

EXHIBIT C

INFORMATION CONCERNING THE ENGINEERING, PROCUREMENT AND CONSTRUCTION AGREEMENT (EPC CONTRACT)

Combined Application of South Carolina Electric & Gas Company for a Certificate of Environmental Compatibility and Public Convenience and Necessity and for a Base Load Review Order
Public Service Commission Docket No. 2008-196-E

1. INTRODUCTION

This **Exhibit C** provides an overview of the terms of the Engineering, Procurement and Construction Agreement (EPC Contract) related to two Westinghouse AP1000 Advanced Passive Safety Power Plants units to be constructed as the V. C. Summer Nuclear Station (VCSNS) Units 2 & 3 (the Units or the Facility). The costs and payments related to construction of the Units are set forth in **Exhibit F** to this Application.

2. TERMS OF THE EPC CONTRACT

Overview – South Carolina Electric & Gas Co., for itself, and as agent for the South Carolina Public Service Authority (Santee-Cooper), has finalized an EPC Contract with a consortium consisting of Westinghouse Electric Co., LLC (Westinghouse) and Stone & Webster, Inc., a subsidiary of the Shaw Group, Inc. (Shaw). Westinghouse is engaged in the business of designing, developing and supplying commercial nuclear facilities and has developed a pressurized water nuclear power plant known as the AP1000. Shaw is engaged in the business of designing and constructing industrial and power generation facilities. Under the EPC Contract, Westinghouse and Shaw will provide the design, engineering, procurement and installation of the equipment and materials, and construction and testing of two nuclear units based on the AP1000 design. (Except as otherwise indicated, capitalized items indicate defined terms in the EPC Contract.)

Schedule – The proposed Guaranteed Substantial Completion Dates for the two nuclear units are April 1, 2016 and January 1, 2019, respectively. On March 31, 2008, SCE&G issued a Limited Authorization to Proceed to Westinghouse/Stone & Webster for the procurement of major equipment in order to meet this schedule. SCE&G and Westinghouse/Stone & Webster signed the EPC Contract on May 23, 2008. The Combined Construction and Operating License Application (COLA) was submitted to the NRC on March 31, 2008 with an anticipated NRC review time of three and one half years. NRC approval of the COLA is required prior to the initiation of nuclear safety related construction. In the meantime, non-nuclear safety related construction will proceed upon the approval of the Public Service Commission and other permitting agencies.

Performance Standards – The EPC Contract requires Westinghouse/Stone & Webster to perform and complete its obligations under the EPC Contract in accordance with applicable laws, the terms of the EPC Contract, Industry Codes and Standards and Good Industry Practices, all of which are explicitly defined in the EPC Contract. Westinghouse/Stone & Webster is solely responsible for all construction means, methods, techniques, sequences, procedures, safety and quality assurance and quality control programs in connection with the performance of the Westinghouse/Stone & Webster work. Project Work and financial reporting are clearly defined in the EPC Contract in order to maintain an ongoing awareness of the project status and communicate accurate work schedules and financial projections. The EPC Contract provides a detailed Scope of Work/Supply and Division of Responsibilities for Westinghouse/Stone & Webster and SCE&G.

Subcontractors and Vendors – Westinghouse/Stone & Webster has the right to have portions of the work performed by subcontractors who are identified in the EPC Contract and subject to SCE&G's review. Westinghouse/Stone & Webster is responsible for the actions and omissions of all subcontractors. Westinghouse/Stone & Webster is responsible for all equipment meeting the requirements of the EPC Contract. For Major Equipment, specifically identified in the EPC Contract, Westinghouse/Stone & Webster contractually commits that it shall in good faith fully and promptly perform and observe all of the agreements, terms, covenants and conditions required to be performed by Westinghouse/Stone & Webster under any material provision of a subcontract for Major Equipment (a "Major Equipment Purchase Order"). The EPC Contract includes specific controls for Major Equipment Vendors, to include shop schedule reservation, default notices and follow-action required and termination protection requirements for SCE&G.

Permits and Licenses – SCE&G is responsible for obtaining, maintaining and paying for SCE&G permits and licenses, to include the Combined Operating License ("COLA") for the Units. Westinghouse/Stone & Webster is committed to providing support in this effort including support for Nuclear Regulatory Commission ("NRC") inspections, tests and analysis in accordance with the NRC's Integrated Tests, Acceptance and Approval Criteria (ITAAC).

Quality Assurance – Westinghouse and Stone & Webster has sole responsibility for the quality assurance and quality control of their work. Westinghouse/Stone & Webster will utilize a Project Quality Assurance Program (PQAP) that meets the Code of Federal Regulations and that is accepted by SCE&G. The PQAP and associated policies and procedures shall address Westinghouse/Stone & Webster's Scope of Work, including, without limitation, systems, structures and components in a manner consistent with their classification with respect to their importance to nuclear safety or their importance to the capacity, operability and reliability of the Facility as classified in the AP1000 Nuclear Power Plant Design Control Document. The EPC Contract (Article 5) also includes requirements for subcontractor quality assurance, reporting of defects and noncompliance, quality control and inspection activities, access and auditing at Westinghouse/Stone & Webster and subcontractor facilities, witness and hold points for manufacturing and fabrication of equipment and SCE&G's right to inspect and stop work. SCE&G shall have reasonable access to the work at the Westinghouse and Stone & Webster's facilities and their subcontractor's facilities for observation and inspection, including auditing of activities for conformance with the requirements of the PQAP.

Pricing – The contract price and price adjustment provisions are detailed in the EPC Contract. The pricing model used to develop the definitive Contract Price is consistent with Westinghouse/Stone & Webster's Scope of Work and project schedule referenced in the EPC Contract. The EPC Contract provides detail for each of the pricing categories, to include Equipment, Transportation, Home Office, Construction – Direct, Construction – Indirect, QA , Other and Cost Contingency. The pricing model also includes three categories of pricing elements, to include Fixed or Firm (Fixed/Firm) Price, Target Price and Time and Material (T/M) Price.

Under Fixed/Firm pricing, fixed elements have no associated escalation rates. Firm elements are subject to definitively established escalation percentages, such that final price depends only upon the timing of completion of the work, or are subject to reported inflation indices. See **Exhibit I** to this Application for more information concerning the indices and escalation factors that apply to each of the categories of work under the EPC Contract.

The Fixed or Firm Price applies to the portions of Westinghouse/Stone & Webster's Scope of Work in a number of areas that are well defined, including Equipment, work with detailed scope descriptions and clear division of responsibilities, interfaces with other work, scheduling, manufacturing and procurement. Fixed/Firm price billing will be established with a series of progress and milestone payments based on project schedule milestones or equipment milestones.

Westinghouse/Stone & Webster and SCE&G's goal in the negotiations has been to maximize the Firm/Fixed portion of the pricing. More than fifty percent (50%) of the total EPC Contract cost is subject to Fixed/Firm pricing. An additional percentage of the contract cost projection may be converted to Fixed/Firm in future months upon acceptance by SCE&G of Fixed/Firm quotes from Westinghouse/Stone & Webster which Westinghouse/Stone & Webster has agreed to provide for aspects of the work. The precise percentages in question are provided on the Confidential Version of **Exhibit I**.

The Target Price applies to the portions of Westinghouse/Stone & Webster's Scope of Work that are not as well defined or would involve higher levels of price and schedule risk and contingency. As part of the Target Price approach, a payment structure is applied that provides incentive to complete the Target Price portion of work under the Established Target Price by having SCE&G and Westinghouse/Stone & Webster share proportionally the savings. Conversely, the Westinghouse/Stone & Webster profit is reduced in proportion to the degree to which the Target Price Work exceeds the Established Target Price with a profit minimum established. A projected payment plan based on the work to be performed and with itemized projected costs will be provided to SCE&G prior to the commencement of Target Price Work.

The Time and Materials (T&M) portion of the Contract Price covers the portions of Westinghouse/Stone & Webster's Scope of Work which cannot be fully defined at this time for any number of reasons. T/M rates agreed upon by SCE&G and Westinghouse/Stone & Webster are included in the EPC Contract. The Westinghouse/Stone & Webster Sales, General & Administrative Costs (SGA) are clearly shown in the Contract Pricing and open for SCE&G's review. Estimated costs for these aspects of the work are included in the Contract price and is reflected on in the capital cost projections contained in **Exhibit F**.

Values for certain Westinghouse/Stone & Webster contingencies and risks have been negotiated and are set forth in **Exhibit I** to this Application. The price adjustment indices will include negotiated indices as well as industry and market based indices.

Change Orders – Article 9 of the EPC Contract specifies the criteria for authorized Changes in the work. Westinghouse/Stone & Webster is entitled to a Change Order under certain designated conditions, which specified conditions include, without limitation, such things as a Change in Law or an Uncontrollable Circumstance defined in Article 1 of the EPC Contract. The EPC Contract specifies those types of Changes that require SCE&G approval. Furthermore, SCE&G can request a Change if it does not adversely impact nuclear or industrial safety and if it results in a financial benefit to SCE&G. The Change Order process is outlined in Article 9, to include the information required with the Change Order submittal, review and agreement by Westinghouse/Stone & Webster and SCE&G, payment schedule and the handling of disputes.

Testing and Acceptance – Article 11 of the EPC Contract gives the scope of testing at the site, to include Construction and Installation Tests, Preoperational Tests, Startup Tests and the Performance Test. The adequacy of construction and installation of components and systems will be verified by construction inspection and installation tests. During the construction period, Westinghouse/Stone & Webster erects the structure, installs plant equipment and performs construction verification and inspection tests. All of these activities are executed, controlled and documented in accordance with Westinghouse/Stone & Webster approved procedures. On a system basis, completion of this phase of the test program demonstrates that the system is ready for Preoperational Testing.

The system will be turned over to the Joint Test Working Group consisting of Westinghouse/Stone & Webster and SCE&G personnel, under the direction of Westinghouse/Stone & Webster. Preoperational Tests will be performed to demonstrate that the components and systems perform in accordance with selected design requirements so that initial Nuclear Fuel loading, initial criticality and subsequent power operation can be safely undertaken in accordance with requirements of the Law and applicable Government Approvals.

Upon the successful completion of the Preoperational Test for a system or facility and provided that the other criteria specified in Article 12 of the EPC Contract are satisfied, Mechanical Completion for that system will be declared. At that point, Westinghouse/Stone & Webster will turn over care, custody and control of that system to SCE&G. Once all systems and facilities are turned over SCE&G, mechanical completion of the Plant is achieved.

The Startup Test program, which remains under the direction of the Joint Test Working Group, will begin with initial Nuclear Fuel loading and progresses through heat-up, criticality and power operations, completing the nuclear operating objectives and verifications specified in the EPC Contract. Upon successful completion of the Startup Tests, the Performance Test will be run to determine whether the Unit meets the Net Unit Electrical Output Guarantee. This test for the Unit will be conducted during a period of continuous operation of one hundred hours. Upon successful completion of the Performance Test, Substantial Completion will be declared.

Final Completion of a Unit shall be deemed to have occurred upon the completion of the Final Completion Punch List and other work required under the EPC Contract with the exception of obligations under the Warranties. Article 13 of the EPC Contract specifies the liquidated damages that Westinghouse/Stone & Webster will be responsible for due to Substantial Completion schedule delays and/or unsatisfactory Performance Test results.

Warranties – As required by Article 14 of the EPC Contract, Westinghouse/Stone & Webster warrants that the Equipment and each Unit shall be free from defects in design, workmanship and material and shall conform to the design specifications and drawings, and changes thereto, prepared by Westinghouse/Stone & Webster or its subcontractors for the design, engineering and construction of the Facility. This section of the EPC Contract covers other requirements, to include warranty periods, remedy, warranty work deferral, services warranty, warranty of title and limitations and disclaimers.

Miscellaneous – The remaining articles of the EPC Contract cover the following: Insurance; Limitation of Liability; Liens; Proprietary Data; Environmental - Hazardous Materials; Title - Risk of Loss; Suspension and Termination; Safety - Incident Reporting; Qualifications and Protection of Assigned Personnel (including provisions for fitness for duty and security screening; training to environmental, OSHA, NRC and other applicable Laws, NRC Whistleblower Provision and respirator protection); Records and Audits; Taxes; Dispute Resolution; Notices; Assignment; Waiver; Modification (pertains to EPC Contract provisions); Survival; Transfer; Governing Law - Waiver of Jury Trial - Certain Federal Laws; Relationship of Owner (SCE&G) and Contractor (Westinghouse/Stone & Webster); Third Party Beneficiaries; Representations and Warranties; and Miscellaneous Provisions.

EXHIBIT D

INFORMATION CONCERNING OTHER SUPPLIERS AND CONTRACTORS

Combined Application of South Carolina Electric & Gas Company for a Certificate of Environmental Compatibility and Public Convenience and Necessity and for a Base Load Review Order
Public Service Commission Docket No. 2008-196-E

1. INTRODUCTION

This **Exhibit D** provides information concerning the supplier for major components of the proposed V. C. Summer Nuclear Station (VCSNS) Units 2 & 3 and the basis for selection of suppliers and quality control by the principal nuclear systems contractor, Westinghouse Electric Company, LLC (Westinghouse). Under the terms of the Engineering, Procurement and Construction Agreement (EPC Contract) for Units 2 & 3, certain suppliers of major components have been selected for the project, and other suppliers of major components will be selected from pre-approved lists. All suppliers will be screened and required to comply with Westinghouse's quality assurance program, as described below.

2. QUALITY ASSURANCE PROGRAM

Overview – Westinghouse uses a comprehensive evaluation methodology to select vendors to supply components for the AP1000 Advanced Passive Safety Power Plant (AP1000). Important factors influencing a decision to source a supplier for a component include: the supplier being listed on the Westinghouse qualified suppliers list, the supplier having a standing relationship with Westinghouse for the supply of the specific type of component, and the supplier having a proven track record of successfully supplying quality components to the nuclear industry. Once it has been determined that a vendor satisfies these criteria, Westinghouse conducts an onsite audit to perform an in-person assessment of the potential supplier's facilities, capabilities, and programs. The qualification process is further described below.

The Westinghouse Quality Management System – The Westinghouse Quality Management System (QMS) requires that suppliers of safety-related items and services be evaluated and approved by Westinghouse Quality prior to the supplier's designation as a qualified supplier, or placement of a purchase order to the supplier. Active qualified suppliers of safety-related items, including suppliers accredited under national industry codes such as ASME, are evaluated annually and audited, except under special circumstances, every three years. Westinghouse Quality determines the need to conduct supplier audits based on an evaluation that is conducted in accordance with ASME NQA-1. Documentation of the acceptability of suppliers is maintained and identifies the items and/or services to be supplied.

Suppliers are evaluated and selected considering the historical quality performance data and audit/survey reports to the extent applicable to the item or service being procured. Westinghouse has developed the procedures for the evaluation and selection of suppliers as well as monitoring of supplier performance in accordance with quality requirements including the following:

- Westinghouse procedures specify the requirements for the Supplier's quality assurance program which must be established and implemented for the supply of the designated items and services. These documents specify the administrative requirements applicable to Westinghouse witness/hold points.

- Westinghouse procedures detail the requirements for the Supplier's quality system used in design, testing and manufacture of nuclear safety-related equipment, system and components. The requirements are derived from the basic and supplemental requirements of ASME NQA-1, Part 1, 1994 Edition. This procedure implements the requirements of PQR-1 for safety-related items.

- The Westinghouse procedure for Supplier Qualification and Evaluation establishes the requirements for evaluation and qualification of Suppliers and for conducting a quality program audit. Results of evaluations and audits performed under this procedure are documented in a Supplier Audit/Evaluation Survey (SAES) form. Suppliers that have been determined to be qualified, in accordance with Westinghouse procedures are placed on the Qualified Suppliers List for the item or service evaluated. Qualified Suppliers are to be audited or surveyed on a triennial basis, or more frequent if circumstances dictate.

For evaluation of Suppliers, Westinghouse may directly perform audits or, as member of the Nuclear Industry Assessment Committee (NIAC), evaluate audits performed by the NAIC's shared audit program. NIAC was formed in 1994 as an industry initiative to share the results of supplier audits. The NAIC Shared Audit Program is based on a standardized approach for the performance of supplier assessments, utilizing a standard assessment checklist approved by all member of the NIAC. The assessment checklist delineates those criteria of 10CFR50 Appendix B, ANSI N45.2, ASME NQA-1, ASME NCA-4000 and/or NCA-3800, which are applicable to nuclear suppliers for the item or service being supplied by the supplier. For suppliers that are ASME certificate holders, they may be placed on the Westinghouse Qualified Suppliers List based on their certificates and are then subsequently audited during the fabrication process.

3. DESIGNATED SUPPLIERS AND POTENTIAL SUPPLIERS

Table 1 contains a list of potential Westinghouse major component suppliers for the AP1000 units to be built as VCSNS. The table shows the suppliers that have been qualified by the above Westinghouse criteria, suppliers that will partake in the China AP1000 projects, suppliers that currently supply to operating US nuclear plants, and which suppliers have been visited by Westinghouse. The pages after Table 1 give belief descriptions of each major component vendor.

Reactor Vessel Head	Doosan Heavy Industries & Construction Company	X	X	X	X
Reactor Coolant Pumps	Curtiss-Wright/ Electro-Mechanical Corporation	X	X	X	X
Reactor Internals	Doosan Heavy Industries & Construction Company	X	X	X	X
	Major Tool & Machine, Inc				X
	Precision Custom Components				X
	Westinghouse Electric, LLC	X	X	X	X
Turbine Generator	Toshiba Corporation	X		X	
Transformers	Westinghouse Electric Supply Co.	X		X	X
Control Rod Drive Mechanism System	Curtiss-Wright/ Electro-Mechanical Corporation	X		X	X
Balance of Plant Pumps	Curtiss-Wright/ Electro-Mechanical Corporation	X		X	X
	Flowserve Corporation	X		X	X
	The Weir Group PLC	X			X
	KSB	X			X
Containment Air Baffle	Ansaldo Camozzi	X		X	X
	Chicago Bridge & Iron Company	X			
	Joseph Oat	X		X	X
Tanks	Ansaldo Camozzi	X		X	X
	IHI Corporation	X		X	X

Component Name	Vendor / Alternate Vendors	W Qualified Supplier	Supplier to China AP1000 Project	Supplier to Nuclear Fleet	Vendor Shop Visit by W SCM
Pressurizer	Ansaldo Camozzi	X		X	X
Reactor Coolant Piping	Tioga Pipe Supply Company	X		X	X
Containment Vessel	Ansaldo Camozzi	X		X	X
	Chicago Bridge & Iron Company	X			
	Northrop Grumman Newport News				
Diesel Generators	Caterpillar Inc.			X	
Variable Frequency Drive Unit for Reactor Coolant Pumps	Siemens Corporation	X	X	X	X
Cooling Towers	SPX Cooling Technologies, Inc. (Marley)			X	
	Zurn Company (Wilkins)			X	

Ansaldo Camozzi

The Camozzi Group is actively involved in the Energy sector through Ansaldo Camozzi Energy Special Components; the company has a long tradition in the nuclear special components market, having manufactured large-sized, high- complexity components that have met the highest quality standards and are in operation in various nuclear plants world-wide for many years.

The Energy Division develops its activity at the premises in Milan, Italy with more than 200 people and on a covered area of 16,000 sqm. Ansaldo Camozzi Nuclear & Energy Special Components is an ASME N stamp holder since 1973. It was the first company outside the USA to obtain the N and NPT ASME stamp. In 1977, Ansaldo Camozzi Nuclear & Energy Special Components was listed in NRC White Book. During 1994 the Certification of the Quality System according to ISO 9001 was obtained.

On December 21, 2007 – Ansaldo Camozzi Energy Special Components S.p.A. (Camozzi Group), and Mangiarotti S.p.A. announced the signature of a co-operation agreement aimed at strengthening the ability to take on the nuclear market demands, by guaranteeing the availability of a coastal plant for the optimization of the transportation and logistics of large-size components.

The synergy between Ansaldo Camozzi Nuclear & Energy Special Components S.p.A. and Mangiarotti S.p.A**.** is expected to lead to the employment of a total of 400 highly specialized technicians and to a production area of over 50,000 sqm, equipped with the best production equipment for the reference markets.

Quality programs and certifications (e.g. ASME N and NPT stamps) from Ansaldo Camozzi will apply to the new entity which will be known as "Mangiarotti Nuclear S.p.A."

This acquisition will require Westinghouse Quality review and approval prior to contract/fabrication implementation.

Caterpillar Inc.

Caterpillar, Inc. manufactures and sells construction and mining equipment, diesel and natural gas engines, and industrial gas turbines worldwide. Its machinery business includes the design, manufacture, marketing, and sale of construction, mining, and forestry machinery. The company also engages in the design, manufacture, remanufacture, maintenance, and services of rail-related products. The company’s engines business comprises the design, manufacture, marketing, and sale of engines for its machinery; electric power generation systems; on-highway vehicles and locomotives; and marine, petroleum, construction, industrial, agricultural, and other applications, as well as related parts. The company was founded in 1925 under the name Caterpillar Tractor Co. and changed its name to Caterpillar, Inc. in 1986. Caterpillar, Inc. is headquartered in Peoria, Illinois. 2007 revenues at Caterpillar Inc. totaled $42.0 billion.

Chicago Bridge & Iron Company

Chicago Bridge & Iron is a global specialty engineering and construction company of approximately 17,000 employees that design, construct, and maintain liquefied natural gas storage tanks; petrochemical and gas processing plants; steel pressure vessels for high-temperature and nuclear containment applications; and heat transfer equipment. CB&I has built approximately 75% of the nuclear containment vessels that exist in the United States today. The company also serves other large corporations in the hydrocarbon, energy, power generation, and petrochemical industries. Although it does about one-third of its business in Europe, Middle East, and Africa, almost half of CB&I's revenues are made in North America. CB&I U.S. Operations are headquartered in the Woodlands, TX, with offices in several geographically convenient locations in the U.S.

Curtiss-Wright Electro-Mechanical Corporation

Curtiss-Wright Electro-Mechanical Corporation (CW-EMD) is a leader in the supply of critical function, electro-mechanical products. It is headquartered in Cheswick, PA. Innovative system and product solutions are based in the legacy of over 100 years of Westinghouse technology. More than 50 years ago, CW-EMD built critical function pumps for the first nuclear powered submarine, the USS Nautilus. Today, CW-EMD continues to develop, design and supply advanced electro-mechanical solutions for the US Navy, including the Navy's most advanced motors, generators and secondary propulsors. Within the nuclear utility industry, CW-EMD supplies reactor coolant pumps, seals, motors and control rod drive mechanisms.

Doosan Heavy Industries & Construction Company

The Doosan Group, with a history spanning over 112 years, is the oldest and one of the largest conglomerates in Korea. Doosan currently has 21 subsidiary companies in Korea and 112 overseas branch corporations in 33 countries. With a total of over 35,000 employees (20,000 in Korea and 15,000 overseas), in addition to a worldwide network of over 3,700 dealers, Doosan continues to implement a truly diversified global management strategy.

Doosan’s annual financial performance has improved from US $2.3 billion in 2000 to US $19.8 billion in 2007 for an annual average growth rate of 34%. In addition, Doosan posted a 25% annual growth in operating profits, rising from US $191.5 million in 2000 to US $1.75 billion in 2007. Today, the Doosan Group has become one of the top ten enterprises in Korea.

ENSA-Equipos Nucleares, S.A.

ENSA specializes in manufacturing high quality heavy components for nuclear plants and industrial facilities that require high standards of quality. The main product line is that of heavy components of the Nuclear Steam Supply System of nuclear reactors. Other lines include smaller items for nuclear reactors, components for storage and transport of spent fuel assemblies and the design, supply and installation of equipment for radioactive waste treatment. ENSA is located in Maliaño (Cantabria), on the northern coast of Spain. The plant started operations at the end of 1976. ENSA is accredited as an ASME Section III qualified supplier and holder of an N-stamp. They are also certified to meet the requirements of ISO 9001.

Flowserve

Flowserve Corporation develops, manufactures, and sells precision-engineered flow control equipment, as well as provides a range of aftermarket equipment services. It operates in three divisions: Flowserve Pump, Flow Control, and Flow Solutions. The Flowserve Pump division offers engineered and industrial pumps and pump systems; submersible motors; replacement parts; and related equipment primarily to industrial markets. The Flow Control division designs, manufactures, and distributes industrial valve products. The Flow Solutions division offers mechanical seals, sealing systems, and parts principally to process industries. Flowserve Corporation operates in North America, Europe, Middle East, Africa, Asia Pacific, and Latin America. The company was founded in 1912 and is headquartered in Irving, Texas. Flowserve has more than 14,000 employees in more than 56 countries, and its revenues were $3.8B in 2007.

IHI Corporation

IHI provides the primary equipment for hydroelectric, thermal and nuclear power systems. IHI is one of the three major Japanese manufacturers of boilers, which are a core element in thermal power plants. In addition to supplying boilers to many domestic Japanese power companies, IHI has been supplying power generation boilers to Australia, Southeast Asia, China, the Middle East and North America, including ten 660,000 kW boilers to Australia. IHI has manufactured and constructed ultra-large scale boilers of over 1 million kW capacities for power generation. In nuclear power generation, IHI supplies main components such as reactor pressure vessels, primary containment vessels and piping systems. IHI employees 6,864 people and had net sales of $11.7 billion in 2007. IHI is headquartered in Tokyo, Japan and has a small ownership interest in Westinghouse Electric Company, LLC.

Joseph Oat

Joseph Oat Corporation is located on the Delaware River in Camden, New Jersey, directly across the river from Philadelphia, Pennsylvania. It is a privately owned company with approximately 117 employees. Joseph Oat Corporation's plant consists of 140,000 sq. ft. of manufacturing space which allows them to fabricate vessels up to 20 ft. (6.1 M) in diameter, weighing up to 400,000 lbs. (182,000 kg.) and having an overall length of up to 200 ft. (60.8M) in one piece

Joseph Oat Corporation produces heat exchangers, pressure vessels, and specialty products for general industrial applications and for the power industry as well as nuclear and fossil fueled power, geothermal, cogeneration and other power applications. The company fabricates products from virtually all metals used in construction, including carbon and low alloy steels, austenitic and ferritic grades of stainless steel, duplex steels, nickel alloys, copper and copper alloys, titanium and titanium alloys, zirconium, and tantalum. The company also fabricates stainless clad, nickel alloy clad, and titanium and zirconium cladded materials.

Joseph Oat holds the following Certificates of Authorization from ASME: N (N-1488), NA (N-1577), NPT (N-1489), NS (N-3014), R, U (Cert. # 184) U2 (Cert. # 27842), and S (Cert. # 25723). Most equipment the company produces is designed and fabricated in accordance with ASME Code standards, including ASME Section I, Section III (Class 1, 2, and 3), and Section VIII Div 1 and 2. They are ISO Certified 9001: 2000.

The Joseph Oat Corporation has previous Westinghouse experience of more than $20 million in sales.

KSB

The KSB Group is one of the leading producers of pumps, valves and related systems. KSB has 14,000 employees around the world in building services, industry and water utilities, the energy sector and mining. KSB is increasingly a service partner and provides complete hydraulic systems for water supply and drainage. KSB has more than 30 manufacturing sites in 19 countries.

KSB supplies a full range of pumps, valves, motors, actuators and systems for building or upgrading power stations and district heating systems. These devices help manage boiler feed water, condensate, cooling water and coolant systems. The KSB Group operates in over 100 countries, with sales companies, offices, agencies and 32 manufacturing sites. KSB complies with rules of the American Society of Mechanical Engineers (ASME) and other international certification bodies. In 2007, KSB had $2.5 billion in sales revenue. KSB is headquartered in Frankenthal, Germany.

Major Tool & Machine, Inc.

Major Tool & Machine, Inc is engineering, fabrication, and machining services company, with over 60 years of experience, serving the aerospace, defense, launch vehicle, power generation and transportation markets. Major Tool & Machine's main facility is located in Indianapolis, Indiana. Major Tools & Machine holds the following Certificates of Authorization from ASME: N, NA, NPT and NS Stamps.

Northrop Grumman Newport News

For more than a century, Northrop Grumman Newport News has designed, built, overhauled and repaired a wide variety of ships for the U.S. Navy and commercial customers. Today, Newport News is the nation's sole designer, builder and refueler of nuclear-powered aircraft carriers and one of only two companies capable of designing and building nuclear-powered submarines. The company also provides after-market services for a wide array of naval and commercial vessels, and in November 2001, became a sector of Northrop Grumman Corporation.

With facilities located on more than 550 acres along two miles of waterfront in Newport News, Virginia, the Newport News sector employs more than 21,000 people, many of whom are third and fourth generation shipbuilders.

Precision Custom Components

Precision Custom Components is a manufacturer of custom fabricated pressure vessels, reactors, casks, and heavy walled components requiring highly specialized machining, welding, and/or fabrication. PCC maintains full in-house capabilities, providing services for Engineering, Drafting, Inspection, Non-Destructive Testing, Metallurgical Testing, and Welding Development. PCC's flexible 250,000 square feet manufacturing facility has 280 employees is located on 11 acres in York, Pennsylvania. The company has sales revenue between $25 million and $49.9 million yearly. Precision Custom Components quality system programs meets or exceeds ASME Section III, Division 1 & 3, ASME Section VIII, Division 1, 2, & 3, ASME Section III Ferrous & New Ferrous Material Organization, 10CFR50 Appendix B, 10CFR71 Subpart H, 10CFR72, subpart G, 10CFR21, and ISO 9001 requirements. In addition, they hold ASME N, NS, NPT, U, U2, U3, and R stamps.

Siemens Corporation

Siemens Energy and Automation, founded in 1847, provides complete electrical, engineering and automation solutions through a commitment to innovative engineering that goes back more than 161 years.

Siemens AG is headquartered in Munich, Germany and employs more than 413,000 professionals at Siemens-affiliated companies worldwide. Siemens 2007 revenues totaled $118.59 billion. Siemens AG operates as electronics and electrical engineering Company worldwide with operations in IT solutions, automation, drives, industrial solutions and services, building technology, power generation, power transmission and distribution, transportation systems, medical solutions, lighting and financial services.

SPX Cooling Technologies, Inc.

SPX is the leading full-line, full-service cooling tower and air-cooled condenser manufacturer. The companies that formed SPX Cooling Technologies were founded more than 100 years ago and have more than 250 global patents in the power generation, industrial, refrigeration, and HVAC markets. SPX's corporate headquarters is located in Overland Park, Kansas.

With more than 150 offices, subsidiaries, and partners worldwide, they have the global reach and local services necessary to deliver solutions. SPX Cooling Technologies is a unit of SPX Corporation, a global provider of technical products and systems, industrial products, flow technology, cooling technologies and service solutions.

The Weir Group PLC

The Weir Group PLC, together with its subsidiaries, provides specialized mechanical engineering solutions worldwide. It operates in three segments: Engineering Products; Engineering Services; and Defense, Nuclear, and Gas. The Engineering Products segment includes its minerals, clear liquid, and valves and controls operations. Its minerals operations include the design and manufacture of pumps, valves, hydro-cyclones, and wear resistant linings for the mining and mineral processing, power sector, and general industries. The clear liquid operations involve the design, manufacture, and service of engineered pumps and fluid handling systems for oil and gas, power generation, water and waste water, hydrocarbon processing, and general industrial projects. The valves and controls operations include the development, manufacture, and supply of valves and controls for the power generation, oil and gas, and general industrial markets. The company was founded in 1871 and is headquartered in Glasgow, United Kingdom. Weir employs approximately 8,000 people worldwide. The Weir Group PLC grew revenues were $2.1B in 2007.

Tioga Pipe Supply Company

For over 60 years Tioga has been a top quality material solutions supplier of industrial pipe, fittings, flanges and related products for the Global Power Generation, Nuclear Power Generation, Oil Refining, Gas & Chemical Processing & U.S. Military Shipbuilding. Tioga is headquartered in Philadelphia, PA. Tioga is the longest continuous supplier to have a Nuclear Quality Assurance Program. Tioga has continuously maintained a ASME Nuclear Certificate since 1982. Tioga has been audited by NUPIC and NIAC that meets the complex requirements of ASME Section III, 10CFR50 Appendix B, N45.2, NQA-1, and CAN3-Z299 SERIES.

Toshiba

Toshiba Corporation is a multinational group of manufacturing company, headquartered in Tokyo, Japan. The company's businesses are in high technology, electrical engineering and electronics fields. The company is the world's 9th largest integrated manufacturer of electric and electronic equipment. Toshiba was established in 1875 by Hisashige Tanaka. Toshiba has over 190,000 employees and assets in excess of $50 billion.

Wilkins, a Zurn Company

Wilkins, a Zurn Company, has been supplying quality water control products to the marketplace since 1906. Products include backflow preventers, pressure regulators, and a variety of other support products. Wilkins has 162,000 square foot manufacturing facility in Paso Robles, CA, with over 200 employees and is now part of the Rexnord family of companies.

EXHIBIT E

ANTICIPATED CONSTRUCTION SCHEDULE

Combined Application of South Carolina Electric & Gas Company for a Certificate of Environmental Compatibility and Public Convenience and Necessity and for a Base Load Review Order
Public Service Commission Docket No. 2008-196-E

1. INTRODUCTION

This **Exhibit E** sets forth the current projected milestones under the EPC Contract that are proposed for use of the Office of Regulatory Staff in evaluating the progress of construction of VCSNS Units 2 and 3. These dates are subject to the schedule contingency requested in the Application.

This schedule is based on the generic schedule for Westinghouse AP1000 reactor construction which does not include project and site specific requirements. Certain activities such as the clearing, grubbing and grading at the site will need to commence earlier than listed here for reasons related to specific conditions at the VCSNS site (*i.e.*, the need to complete the site rail line relocation in advance of VCSNS Unit 1 Outage 18).

V. C. SUMMER PROJECT MILESTONES

Year	Quarter	Milestone
2008	2	08-2Q-1 Approve Engineering, Procurement and Construction Agreement. 08-2Q-2 Issue Purchase Orders to nuclear component fabricators for Units 2 and 3 Containment Vessels, Passive Residual Heat Removal Heat Exchangers, Accumulator Tanks, Core Makeup Tanks, Squib Valves, Steam Generators, Reactor Coolant Pumps, Pressurizer Vessels, Reactor Coolant Loop Hot Leg A Piping, Reactor Vessel Internals, Reactor Vessels, Reactor Integrated Head Packages, Control Rod Drive Mechanisms and Nuclear Island structural CA20 Modules.
2008	3	08-3Q-1 Start site specific and balance of plant detailed design. 08-3Q-2 Issue PO and submit payment to fabricator via Westinghouse for Units 2 and 3 Simulators. 08-3Q-3 Issue final Purchase Orders and submit payments to fabricators via Westinghouse for Units 2 and 3 Steam Generators, Reactor Vessel Internals and Reactor Vessels. 08-3Q-4 Issue Purchase Order and submit payment via Westinghouse to fabricator for Units 2 and 3 Transformers.
2008	4	08-4Q-1 Start clearing, grubbing and grading. 08-4Q-2 Issue final Purchase Orders and submit payments to fabricators via Westinghouse for Units 2 and 3 Core Makeup Tanks, Accumulator Tanks, Pressurizers, Reactor Coolant Loop Piping, Integrated Head Packages, Control Rod Drive Mechanisms and Passive Residual Heat Removal Heat Exchangers.

2009	1	09-1Q-1 Start Parr Road intersection work. 09-1Q-2 Issue final Purchase Order and submit payment via Westinghouse to fabricator for Units 2 and 3 Reactor Coolant Pumps. 09-1Q-3 Issue Purchase Order for Long Lead Material and submit payment via Westinghouse to fabricator for Units 2 and 3 Integrated Head Packages. 09-1Q-4 Submit partial payment to Westinghouse for Design Finalization.
2009	2	09-2Q-1 Start site development. 09-2Q-2 Issue Purchase Orders and submit payments via Westinghouse for Units 2 and 3 Turbine/Generators and Main Transformers. 09-2Q-3 Receive Units 2 and 3 Core Makeup Tank material at fabricator. 09-2Q-4 Submit partial payment to Westinghouse for Design Finalization.
2009	3	09-3Q-1 Issue Purchase Order and submit payment via Westinghouse for Unit 2 Turbine Generator Condenser material. 09-3Q-2 Submit payments to fabricators via Westinghouse for Units 2 and 3 Reactor Coolant Pumps and Passive Residual Heat Removal Heat Exchangers. 09-3Q-3 Submit partial payment to Westinghouse for Design Finalization.
2009	4	09-4Q-1 Start erection of construction buildings, to include craft facilities for personnel, tools and equipment; first aid facilities; field offices for site management and support personnel; temporary warehouses; and construction hiring office. 09-4Q-2 Receive Unit 2 Reactor Vessel flange nozzle shell forging at fabricator. 09-4Q-3 Submit partial payment to Westinghouse for Design Finalization. 09-4Q-4 Issue Purchase Order and submit payment via Westinghouse to fabricator for Units 2 and 3 Radiation Monitoring Systems.
2010	1	10-1Q-1 Receive Unit 2 Reactor Vessel Internals core shroud material at the fabricator. 10-1Q-2 Payment to fabricator via Westinghouse for Unit 2 Turbine/Generator Feedwater Heater material. 10-1Q-2 Receive raw material at fabricator for Unit 2 Reactor Coolant Loop piping.
2010	2	10-2Q-1 Receive Unit 2 Reactor Vessel Internals upper guide tube Material at the fabricator. 10-2Q-2 Submit payment to Westinghouse for the Unit 2 Control Rod Drive Mechanisms. 10-2Q-3 Perform cladding on Unit 2 Pressurizer bottom head at fabricator.

2010	3	10-3Q-1 Start excavation and foundation work for the standard plant for Unit 2. 10-3Q-2 Receive Unit 2 Steam Generator tube sheet forging at the fabricator. 10-3Q-3 Complete Unit 2 Reactor Vessel outlet nozzle weld to flange at the fabricator. 10-3Q-4 Start Unit 2 Condenser fabrication at the fabricator.
2010	4	10-4Q-1 Complete preparations for receiving the first module on site for Unit 2. 10-4Q-2 Receive Unit 2 Steam Generator transition cone forging at the fabricator. 10-4Q-3 Complete Unit 2 Reactor Coolant Pump casing fabrication. 10-4Q-4 Complete machining, heat treatment and Nondestructive examination of Unit 2 Reactor Coolant Loop Hot Leg A piping at the fabricator.
2011	1	11-1Q-1 Complete Unit 2 hydrotests for Core Makeup Tanks. 11-1Q-2 Issue Purchase Order and submit payment via Westinghouse to fabricator for Units 2 and 3 Polar Crane main hoist drums and wire rope.
2011	2	11-2Q-1 Receive Unit 3 Control Rod Drive Mechanism latch housing/rod travel housing material at the fabricator. 11-2Q-2 Complete Unit 2 Condenser shipment preparation at the fabricator.
2011	3	11-3Q-1 Start placement of mud mat for Unit 2. 11-3Q-2 Receive Unit 2 Steam Generator tubing at the fabricator. 11-3Q-3 Complete upper head welding on Unit 2 Pressurizer at the fabricator. 11-3Q-4 Complete Unit 3 Reactor Vessel closure head cladding at the fabricator.
2011	4	11-4Q-1 Begin Unit 2 first nuclear concrete placement. 11-4Q-2 Complete fabrication of Unit 2 Reactor Coolant Pump stator core at the fabricator. 11-4Q-3 Begin Unit 2 Reactor Vessel Internals welding of core shroud panel ring at the fabricator. 11-4Q-4 Complete 1st Unit 2 Steam Generator tubing installation at the fabricator. 11-4Q-5 Ship Unit 2 Reactor Coolant Loop pipe to site. 11-4Q-6 Ship Unit 2 Control Rod Drive Mechanism to site. 11-4Q-7Complete weld for Unit 2 Pressurizer lower shell to head at the fabricator. 11-4Q-8 Complete 2nd Steam Generator tubing installation for Unit 3 at the fabricator. 11-4Q-9 Submit partial payment to Westinghouse for Design Finalization.

2012	1	12-1Q-1 Set module CA04 for Unit 2. 12-1Q-2 Complete post weld heat treat of 2nd tubesheet for Unit 2 Passive Residual Heat Removal Heat Exchanger. 12-1Q-3 Complete 1st tubesheet drilling for Unit 2 Passive Residual Heat Removal Heat Exchanger. 12-1Q-4 Complete girder fabrication for Unit 2 Polar Crane. 12-1Q-5 Complete preparations for Unit 3 Turbine Generator Condenser shipment.
2012	2	12-2Q-1 Set Containment Vessel ring #1 for Unit 2. 12-2Q-2 Deliver Unit 2 Reactor Coolant Pump casings to the site. 12-2Q-3 Complete Unit3 Reactor Coolant Pump stator core. 12-2Q-4 Receive core shell forging for Unit 3 Reactor Vessel. 12-2Q-5 Complete Unit 3 Pressurizer cladding on bottom head.
2012	3	12-3Q-1 Set Nuclear Island structural module CA03 for Unit 2. 12-3Q-2 Complete 1st Unit 2 Squib Valve factory operational test . 12-3Q-3 Complete Unit 3 Accumulator Tank hydrotest. 12-3Q-4 Complete electrical panel assembly for Unit 2 Polar Crane.
2012	4	12-4Q-1 Start containment large bore pipe supports for Unit 2. 12-4Q-2 Ship Unit 2 Reactor Integrated Head Package to site from fabricator. 12-4Q-3 Complete Unit 2 Reactor Coolant Pump stator fabrication. 12-4Q-4 Complete 2nd Unit 3 Steam Generator tubing installation at fabricator. 12-4Q-5 Complete 1st Unit 2 Steam Generator hydrotest at fabricator.
2013	1	13-1Q-1 Start concrete fill of Nuclear Island structural modules CA01 and CA02 for Unit 2. 13-1Q-2 Ship Unit 2 Passive Residual Heat Removal Heat Exchanger to site from fabricator. 13-1Q-3 Complete Unit 2 Refueling Machine Assembly factory acceptance test. 13-1Q-4 Ship Unit 2 Reactor Vessel Internals to site from fabricator.

2013	2	13-2Q-1 Set Unit 2 Containment Vessel ring #3. 13-2Q-2 Ship Unit 2 Steam Generator to site from fabricator. 13-2Q-3 Complete preparation for Unit 2 Turbine/Generator shipment from Toshiba fabrication facility. 13-2Q-4 Complete Unit 3 Pressurizer hydrotest at fabricator. 13-2Q-5 Ship Unit 2 Polar Crane to site. 13-2Q-6 Receive Unit 2 Reactor Vessel on site from fabricator.
2013	3	13-3Q-1 Set Unit 2 Reactor Vessel. 13-3Q-2 Weld Unit 3 Steam Generator tubesheet to channel head. 13-3Q-3 Complete Unit 3 Reactor Coolant Pump final stator assembly at fabricator. 13-3Q-4 Ship Unit 2 Reactor Coolant Pumps to site from fabricator. 13-3Q-5 Place first nuclear concrete for Unit 3.
2013	4	13-4Q-1 Set Unit 2 Steam Generator. 13-4Q-2 Preparations complete for shipment of Unit 2 Main Transformers. 13-4Q-3 Complete Unit 3 Steam Generator hydrotest at fabricator. 13-4Q-4 Set Unit 2 Containment Vessel Bottom Head on basemat legs.
2014	1	14-1Q-1 Set Unit 2 Pressurizer Vessel. 14-1Q-2 Complete Unit 3 Reactor Coolant Pump Factory Acceptance Test at fabricator. 14-1Q-3 Ship Unit 3 Reactor Vessel Internals to site from fabricator. 14-1Q-4 Issue Purchase Order and submit payment to fabricator via Westinghouse for Unit 3 Main Transformers.
2014	2	14-2Q-1 Complete welding of Unit 2 Passive Residual Heat Removal System piping. 14-2Q-2 Ship Unit 3 Steam Generator to site from fabricator. 14-2Q-3 Ship Unit 3 Refueling Machine Assembly to site.
2014	3	14-3Q-1 Set Unit 2 Polar Crane. 14-3Q-2 Ship Unit 3 Reactor Coolant Pumps to site from fabricator. 14-3Q-3 Complete shipment preparations for Unit 3 Main Transformers from fabricator.
2014	4	14-4Q-1 Ship last Unit 3 Spent Fuel Storage Rack module to site.
2015	1	15-1Q-1 Start electrical cable pulling in Unit 2 Auxiliary Building. 15-1Q-2 Complete Unit 2 Reactor Coolant System cold hydro.
2015	2	15-2Q-1 Activate class 1E DC power in Unit 2 Auxiliary Building.

2015	3	15-3Q-1 Complete Unit 2 hot functional test. 15-3Q-2 Install Unit 3 ring 3 for containment vessel.
2015	4	15-4Q-1 Load Unit 2 nuclear fuel.
2016	1	16-1Q-1 Unit 2 Substantial Completion.
2016	2	16-2Q-1 Set Unit 3 Reactor Vessel.
2016	3	16-3Q-1 Set Unit 3 Steam Generator #2.
2016	4	16-4Q-1 Set Unit 3 Pressurizer Vessel.
2017	1	17-1Q-1 Complete welding of Unit 3 Passive Residual Heat Removal System piping.
2017	2	17-2Q-1 Set Unit 3 polar crane.
2017	3	17-3Q-1 Start Unit 3 Shield Building roof slab rebar placement.
2017	4	17-4Q-1 Start Unit 3 Auxiliary Building electrical cable pulling.
2018	1	18-1Q-1 Activate Unit 3 Auxiliary Building class 1E DC power.
2018	2	18-2Q-1 Complete Unit 3 Reactor Coolant System cold hydro. 18-2Q-1 Complete Unit 3 hot functional test.
2018	3	18-3Q-1 Complete Unit 3 nuclear fuel load.
2018	4	18-4Q-1 Begin Unit 3 full power operation.
2019	2	19-1Q-1 Unit 3 Substantial Completion.

EXHIBIT I

INFLATION INDICES

PUBLIC VERSION

Combined Application of South Carolina Electric & Gas Company for a Certificate of Environmental Compatibility and Public Convenience and Necessity and for a Base Load Review Order
Public Service Commission Docket No. 2008-196-E

1. INTRODUCTION

This **Exhibit I** provides the inflation indices and escalators, and contingency factors used by SCE&G in projecting the capital cost of the two Westinghouse AP1000 Advanced Passive Safety Power Plant (AP1000) units it proposes to construct as V. C. Summer Nuclear Station (VCSNS) Units 2 & 3 (the Units or the Facilities).

2. EXPLANATION OF COST ELEMENTS SUBJECT TO ESCALATION (See Attached Chart A)

Chart A of **Exhibit I** provides the categories of capital investment that have been established for the project. These categories are defined by risk profiles documenting the escalations and contingencies that are applied to base project cash flow. The definitions of these profiles are determined by either contract terms or sound engineering and planning assumptions. Project cash flow is assigned to each risk profile based on common risk characteristics; and escalations and contingencies are applied to generate future cash flow for use in regulatory and planning schedules. Risk profiles are defined below:

1) **Fixed with No Adjustment –** These costs are fixed per the EPC Contract and escalation is not applied. Contingency risk for this cash flow is principally related to change orders and is predicted to be relatively low.

2) **Firm with Fixed Adjustment A –** These costs have a fixed escalation of a specified percentage applied as part of the EPC Contract. Contingency risk for this cash flow is principally related to change orders and is predicted to be relatively low.

3) **Firm with Fixed Adjustment B –** These costs have a fixed escalation of a specified percentage applied as part of the EPC Contract. Under the EPC Contract, this factor is expressed in two parts. One part is an inflation escalator equal to the percentage in item 2 above. The other is a small additional factor that is designated a nuclear industry administration adjustment to compensate Westinghouse for the undertaking the project.

Contingency risk for this cash flow is principally related to change orders and is predicted to be relatively low.

4) **Firm with Indexed Escalation –** Escalation for this schedule of costs is applied periodically under the EPC Contract based on the Handy−Whitman All Steam Generation Plant Index, South Atlantic Region. Handy-Whitman is a well recognized and commonly used construction index. The adjustment as billed under the EPC Contract will reflect the percentage increase in the Handy-Whitman All Steam Generation Plant Index, South Atlantic Region as measured between each bi-annual release of the index. For planning purposes, SCE&G is using the most recent one-year index change for 2008, and the most recent five-year average of the index for 2009 and beyond to escalate these costs. Contingency risk for this cash flow is predicted to be relatively low.

5) **Actual Craft Wages –** Site craft wages will be paid at actual costs. For planning purposes, SCE&G is using the most recent one−year index change of the Handy−Whitman All Steam & Nuclear Generation Plant Index, South Atlantic Region, for 2008, and the most recent five-year average of this index for 2009 and beyond to escalate these costs. Contingency risk for this cash flow is expected to be higher than average.

6) **Non-Labor Costs –** This schedule is paid at actual costs. For planning purposes, SCE&G is using the most recent one-year index change of the Handy−Whitman All Steam & Nuclear Generation Plant Index, South Atlantic Region, for 2008, and the most recent five-year average of this index for 2009 and beyond to escalate these costs. Contingency risk for this cash flow is expected to be moderately high.

7) **Time & Materials –** This schedule is paid at actual costs. For planning purposes, SCE&G is using the most recent one−year index change of the Handy−Whitman All Steam & Nuclear Generation Plant Index, South Atlantic Region, for 2008, and the most recent five-year average of this index for 2009 and beyond to escalate these costs. Contingency risk for this cash flow is expected to be moderately high.

8) **Owners Costs Target Estimates –** This schedule is paid at actual costs. For planning purposes, SCE&G is using the most recent one-year factor of the GDP Chained Price Index, a commonly used U.S. Government published general escalation index, to escalate 2008 costs. The most recent five-year average of this index is used to escalate costs for 2009 and beyond. Contingency risk for this cash flow is expected to be moderately high.

9) **Transmission Costs –** This schedule is paid at actual costs. For planning purposes, the base estimate is escalated based on the most recent Handy−Whitman Transmission Plant Index, South Atlantic Region index, and the most recent five-year average of this index,

is used to escalate costs for 2009 and beyond. Contingency risk for this cash flow is expected to be moderately high.

3. PUBLIC AND CONFIDENTIAL VERSION OF THE INTRODUCTION TO EXHIBIT I AND CHART A TO EXHIBIT I

In response to a claim of confidentiality made by Westinghouse under the provisions of the EPC Contract, SCE&G has prepared public and confidential versions of this introduction to **Exhibit I**, and of **Chart B** to **Exhibit I.** The differences between the two versions are as follows:

a. The public version of this introduction to **Exhibit I** does not specify the percentage of the costs under the EPC Contract that fall within the Fixed/Firm pricing category and the additional percentage of cost that Westinghouse and Stone & Webster have agreed to offer for conversion to Fixed/Firm pricing. The confidential version of the introduction provides these percentages.
b. The public version of this introduction to **Exhibit I**, and of **Chart B** to **Exhibit I** does not provide the specific inflation factors that the EPC Contract has established for the two Firm with Fixed Adjustment Categories. The confidential version sets forth these factors.
c. The public version of **Chart B** to **Exhibit I** does not list the specific items of equipment or cost included in the four Fixed/Firm categories of cost. The confidential version of that document lists the specific items of equipment or cost under the heading "Cost Make-up."

SCE&G intends to make the confidential version of the introduction to **Exhibit I** and of **Chart B** to **Exhibit I** available to parties who sign an appropriate confidentiality agreement.

4. HANDY-WHITMAN AND GDP INDICES
(See Attached Chart B)

Chart B to **Exhibit I** provides five years of historical data for the Handy-Whitman (HW) All Steam Generation Plant, All Steam & Nuclear Generation Plant, and Transmission Plant, for the South Atlantic Region; as well as the Gross Domestic Product (GDP) inflation index. These are the indices discussed in **Chart A** of **Exhibit I** and used by SCE&G in preparing cost projections related to the Facility.

Cost Elements Subject to Escalation & Contingency

	EPC Category	Cost Make-up*	Escalation Indices/Assumptions	Contingency Assumptions
1)	**Fixed with no Adjustment**	Various specified plant components	***Fixed Price not subject to escalation under the EPC Contract.***	***Low Risk – 5%***
2)	**Firm with Fixed Adjustment A**	Other specified plant components	***Fixed escalation of a specified percentage under the EPC Contract.***	***Low Risk – 5%***
3)	**Firm with Fixed Adjustment B**	Specific Westinghouse charges	***Fixed adjustment of different specified percentage under the EPC Contract.*** - **One part of the total percentage is base escalation, and** - **Another part is a nuclear industry administration adjustment.**	***Low Risk – 5%***
4)	**Firm with Indexed Adjustment**	All equipment not listed elsewhere and other costs.	***Adjusted periodically under the EPC Contract by the Handy-Whitman All Steam Generation Plant Index.***	***Low Risk – 5%***
5)	**Actual Craft Wages**	All site craft labor.	***Paid at actual costs. Base estimate is escalated at Shaw/Stone Webster developed market index for target purposes. Handy-Whitman All Steam & Nuclear Generation Index used to escalate for planning purposes.***	***High Risk – 20%***
6)	**Non-Labor Target**	Construction Materials, consumables, furnish & erect subcontractors.	***Paid at actual costs. Base estimate is escalated at a Handy-Whitman All Steam & Nuclear Generation Index for planning purposes.***	***Moderate-High Risk – 15%***
7)	**T&M**	Startup and COLA and other permitting and licensing support.	***Paid at actual costs under the EPC Contract. Base estimate is escalated at Handy-Whitman All Steam & Nuclear Generation Index for planning purposes.***	***Moderate-High Risk – 15%***

	Owners' Cost Category	Cost Make-up	Escalation Indices/Assumptions	Contingency Assumptions
8)	**Project Target Estimates**	All equipment, labor, materials, insurance, overhead, etc. not covered under the EPC Contract.	***Paid at actual costs. Base estimate is escalated at Gross Domestic Product Chained Price Index historical average for planning purposes.***	***Moderate-High risk – 15%***
9)	**Transmission Projections**	New Transmission Lines and Transmission System upgrades to support interconnection of new Nuclear units per Generator Interconnection Facilities Studies.	***Paid at actual costs. Base estimate is escalated at Handy-Whitman Transmission Plant Construction Index for planning purposes.***	***Moderate-High risk – 15%***

* Associated overheads and profits will be included in cost elements.

Public

Exhibit I, Chart B

HW All Steam Generation Plant

Year	Index	Yr/Yr change	Three year Average	Five Year Average	Ten Year Average
2007	491	7.7%	7.0%	5.74%	4.1%
2006	456	7.5%	6.6%	4.8%	
2005	424	5.7%	4.5%	3.7%	
2004	401	6.6%	3.5%	3.6%	
2003	376	1.1%	2.0%	2.3%	
2002	372	2.8%	3.4%	2.5%	
2001	362	2.3%	2.6%		
2000	354	5.0%	2.5%		
1999	337	0.6%			
1998	335	1.8%			
1997	329				

Exhibit I, Chart B

HW All Steam + Nuclear Generation Plant

Year	Index	Yr/Yr change	Three year Average	Five Year Average	Ten Year Average
2007	490	7.7%	7.0%	5.75%	4.1%
2006	455	7.6%	6.7%	4.8%	
2005	423	5.8%	4.5%	3.7%	
2004	400	6.7%	3.5%	3.6%	
2003	375	1.1%	2.0%	2.4%	
2002	371	2.8%	3.4%	2.5%	
2001	361	2.3%	2.6%		
2000	353	5.1%	2.5%		
1999	336	0.6%			
1998	334	1.8%			
1997	328				

Exhibit I, Chart B

HW All Transmission Plant

Year	Index	Yr/Yr change	Three year Average	Five Year Average	Ten Year Average
2007	518	8.8%	8.1%	6.86%	4.5%
2006	476	9.2%	8.6%	5.3%	3.6%
2005	436	6.3%	5.4%	4.0%	
2004	410	10.2%	3.6%	4.0%	
2003	372	-0.3%	1.1%	1.6%	
2002	373	0.8%	3.4%	2.1%	
2001	370	2.8%	2.4%		
2000	360	6.5%	2.4%		
1999	338	-2.0%			
1998	345	2.7%			
1997	336				

Exhibit I, Chart B

SERIESTYPE	UNIT	SHORT LABEL	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Chained Price Index--Gross Domestic Product												
U.S. Macro - 10 Year Basel	(2000=100)	Chained price index-gross domestic product	96.48	97.87	100.00	102.40	104.19	106.41	109.46	113.01	116.57	119.67
Annual Percent change				1.44%	2.18%	2.40%	1.75%	2.13%	2.87%	3.24%	3.15%	2.66%
3-Year Annual Percent change							2.11%	2.09%	2.25%	2.74%	3.09%	3.02%
5-Year Annual Percent change									**2.26%**	**2.48%**	**2.63%**	$\boxed{\textbf{2.81\%}}$
10-Year Annual Percent change												
Consumer Price Index, All-Urban												
U.S. Macro - 10 Year Basel	Index	Consumer price index, all-urban	1.63	1.67	1.72	1.77	1.80	1.84	1.89	1.95	2.02	2.07
Percent change				2.19%	3.37%	2.82%	1.60%	2.30%	2.67%	3.37%	3.23%	2.86%
3-Year Annual Percent change							2.59%	2.24%	2.19%	2.78%	3.09%	3.15%
5-Year Annual Percent change									2.55%	2.55%	2.63%	2.88%
10-Year Annual Percent change												
Producer Price Index--Finished Goods												
U.S. Macro - 10 Year Basel	(1982=1.0)	Producer price index-finished goods	1.31	1.33	1.38	1.41	1.39	1.43	1.48	1.56	1.60	1.67
Percent change				1.82%	3.76%	1.94%	-1.30%	3.18%	3.62%	4.85%	2.95%	3.92%
3-Year Annual Percent change							1.44%	1.26%	1.81%	3.88%	3.81%	3.91%
5-Year Annual Percent change									2.22%	2.44%	2.64%	3.71%
10-Year Annual Percent change												

EXHIBIT J

RISK FACTORS RELATED TO CONSTRUCTION AND OPERATION OF THE FACILITY

Combined Application of South Carolina Electric & Gas Company for a Certificate of Environmental Compatibility and Public Convenience and Necessity and for a Base Load Review Order
Public Service Commission Docket No. 2008-196-E

1. INTRODUCTION

This **Exhibit J** provides an overview of certain of the major risk factors related to the permitting, construction and placing into service of two Westinghouse AP1000 Advanced Passive Safety Power Plants units as V. C. Summer Nuclear Station (VCSNS) Units 2 & 3 (the Units or the Facilities). The attached **Chart A** to this **Exhibit J** provides a list of certain of those risk factors in tabular form.

2. OVERVIEW

The risk factors related to the Facilities fall into several broad categories. Certain of the risk factors are risks that are typical of construction projects of the size and complexity of the Facilities. Others are related to the degree and sensitivity of the regulatory and safety oversight that are involved in nuclear construction. Still others are related to the fact that the Units will be among the first new nuclear units sited and built in the United States since the 1970s and 1980s, and will be among the first of what are anticipated to be a dozen or more new Westinghouse AP1000 units to be constructed in the United States and other countries over the next decade.

The discussion of risks that follows should be balanced by an appreciation of the factors that establish nuclear generation as the most prudent choice for meeting the growing energy needs of SCE&G's customers. Among those factors are the high cost of coal and new coal-fired capacity; the environmental concerns surrounding the construction of additional coal-fired generation; the uncertainty as to future costs or limitations imposed on CO_2 emissions; the uncertainty as to future natural gas prices and supplies; the relatively large amount of gas-fired generation already included in SCE&G's generation mix; the clear need for additional base load capacity, as opposed to intermediate gas-fired capacity, on SCE&G's system; the uncertainty as to the future costs and availability of AP1000 units or other nuclear units as the cost of alternative energy rises and global demand for these units increases; the value of special Federal tax incentives for those companies building nuclear units in the first phase of the present construction cycle; and other factors.

More specifically, the choice of the AP1000 units and Westinghouse/Stone & Webster as suppliers and contractors, are justified by the safety, simplicity, and logic of the AP1000 design; the superior experience and track record of Westinghouse and Stone & Webster in the nuclear power systems and nuclear power plant construction industries; and the wide acceptance of the AP1000 design among the utilities planning to build new nuclear units in the near future. In addition, because the Units will be among the first Westinghouse AP1000 units anticipated to be constructed in the United States, suppliers, contractors and others in the industry are expected to have a strong interest in supporting the success of SCE&G's construction and permitting process.

Nevertheless, there are a number of risk factors related to construction of the Units which SCE&G has taken into account in making the decision to construct Westinghouse AP1000 units at this time.

3. LICENSING AND REGULATORY, POLITICAL AND LEGISLATIVE RISK FACTORS

NRC Licensing – The NRC has stated that it prefers to follow a three-step process for the issuance of Combined Operating Licenses ("COLs") for new nuclear facilities:

1. **Final Design Approval –** The first step for licensing of new nuclear units is the issuance of a final design approval which constitutes an approval of the conceptual design of the principal Nuclear Steam Supply Systems and Balance of Plant systems for a type of unit. The AP1000 nuclear design was approved by the Nuclear Regulatory Commission ("NRC") on September 13, 2004 (the "Final Design Approval"). Since the Final Design Approval was initially granted, Westinghouse has applied for approval for design improvements and refinements for the AP1000 unit. Revisions 1-15 have been approved by the NRC. One additional revision is pending at this time.

2. **Reference Unit Licensing –** The second stage in the NRC review and licensing process is the licensing of a specific plant, including all plant systems, facilities and processes, through the Combined Operating License ("COL") process. The NRC has expressed a preference that the potential owners and builder of each type of unit collaborate in the filing of a single, initial COL Application ("COLA") for the type of unit that they are proposing to build. That initial COLA then can be used as a reference case for all similar units. The NRC approval of systems, facilities and processes can then be referenced in COLA proceedings related to other similar units.

   SCE&G is participating in NuStart Energy Development, LLC ("NuStart"), an association of utilities considering constructing nuclear units and of nuclear-systems providers like Westinghouse. In keeping with NRC policy, all Westinghouse AP1000 units are planned to be largely identical except for limited variations required by specific site conditions. The COLA for TVA's Bellefonte Units 3 & 4 has been chosen as the reference case for the AP1000 units (the "Reference Unit COLA"). It was submitted to the NRC on October 30, 2007. NuStart and the Department of Energy are sharing the cost of the Bellefonte licensing process.

3. **VCSNS Units 2 & 3 COL Application –** SCE&G's application for a COL for VCSNS Units 2 & 3 was filed on March 31, 2008, with the NRC. This application builds on the Final Design Approval granted by the NRC for the Westinghouse AP1000 design, and the Reference Unit COLA for Bellefonte Units 3 & 4, and also includes the specific information necessary to allow licensing of construction of the Units at the Jenkinsville site.

Licensing Risk – SCE&G has carefully reviewed the Final Design Approval issued for the Westinghouse AP1000 and the application and the information contained in the Bellefonte Reference Unit COLA. SCE&G believes that AP1000 design can and should be licensed by the NRC for construction under the Reference Unit COLA. Moreover, as explained more fully in Exhibits A and P to this Application, SCE&G and consultants working on its behalf have conducted extensive environmental and site characterization work related to the Jenkinsville site. SCE&G had already studied and evaluated that site extensively as part of the licensing and license extension process for VCSNS Unit 1. Based on the foregoing, and SCE&G's history of successful nuclear operations at the Jenkinsville site going back over 20 years, SCE&G believes that the risks related to the COLA process for the Units are reasonable and the decision to proceed with licensing and construction of the Units is prudent and in the best interest of its customers and the State of South Carolina.

Nonetheless, the risks related to the COLA process include the fact that many of the NRC regulations, standards and processes under which the licensing of the Units will take place are new and relatively untested; NRC staffing to support the new round of nuclear licensing is still being assembled; and many of the personnel that will be involved in this licensing process have not been part of the licensing of new nuclear units at any other time in their careers. As of mid-May of 2008, there were nine COLAs submitted to the NRC. Furthermore, a significant number of COLAs may be submitted in the next 12 months and these additional filings could make it more difficult for NRC to conduct timely reviews of applications.

There are clear advantages to SCE&G being an early applicant for a COL since personnel and resource issues may become more pronounced as the number of applications increase. Nevertheless, the fact remains that the NRC is in the early stages of the current licensing cycle and potential delays in the NRC licensing process can delay the construction schedule. In addition, the degree of opposition to the COLA from various groups cannot be gauged at this time. While the NRC enforces clear limitations on interventions and on the issues that interveners can raise, the degree of delay and expense that intervener opposition might engender in the licensing process is difficult to predict at this time.

Substantive Design, Licensing or Regulatory Compliance Problems – From a substantive standpoint, SCE&G does not believe it is likely that the NRC's COLA review will uncover material design or process issues related to the Units, or related to their siting at the Jenkinsville location. Alternatively, SCE&G believes that if any such flaws are discovered they will be remedied in a timely and cost-effective manner without unduly affecting the schedule or cost of the Units. However, the emergence of substantive design-related or process-related issues is not beyond possibility and the potential for additional cost and delay as a result of them are a part of the risk profile related to the Units. Also, changes in regulatory requirements during the course of construction could result in the need for redesigns, retrofits or reworking of work already completed.

Integrated Tests, Approvals, and Acceptance Criteria ("ITAACs") – One subset of risks related to NRC licensing is the risk related to the criteria and protocols for testing, approval and acceptance of work on the Units as work is completed. This testing, approval and acceptance is known as ITAAC. Under the current approach to licensing adopted by the NRC, the NRC intends to issue a COL for new units in advance of the design/build team completing all aspects of plant design and engineering and before construction drawings are complete. However, to be allowed to proceed with construction and with plant operation, the plant and its major components and systems must meet stringent performance standards. Those standards are measured through performance testing routines and analysis, *i.e.*, ITAACs, which are conducted as important stages of the work are completed.

The NRC has established the ITAAC criteria which the Units and other new nuclear units must meet to ensure the plants will operate as intended. However, those ITAACs could change during the course of the Units' licensing or construction. It is possible that the NRC could require additional ITAACs or increase the scope or stringency of existing ITAACs during the course of construction and testing of the Units. This could happen for any number of reasons, including pressure from interveners in the COL proceedings or changes in public or political attitudes toward nuclear power. In addition, the NRC is still developing the process for approving the results of the ITAAC tests once they are completed and for resolving disputes or other issues related to the results of those tests. The hearing process which would currently apply to ITAAC issues is untested. Those hearings could add expense and delay to the construction of the Units.

SCE&G does not have any basis at present to believe that the ITAAC process will pose significant risks to the schedule or cost estimates presented in this Application. However, risks related to the ITAAC process are risks to which the construction of the Units is subject.

NRC Licensing Generally – At this time, the most significant risks related to NRC licensing appear to be a) the risk of delay in the issuance of a COL, the resulting disruption of the construction schedule, and the increase in construction costs that such a delay would represent; and b) the risks related to changes or delays in the ITAAC process, particularly as construction of the Units enters its latter stages. Nonetheless, the information available to SCE&G at this time indicates that SCE&G should be able to obtain a COL and comply with ITAACs on reasonable terms and conditions, without undue expense, and on a schedule that supports the construction schedule set forth elsewhere in this Application.

Federal Energy Regulatory Commission ("FERC") Approval – The Units will take cooling water from the existing Monticello and Parr Reservoirs located on the Jenkinsville site. These reservoirs are part of a FERC-licensed water power development which was put in service in its current form in 1978 to support VCSNS Unit 1. Because VCSNS Units 2 & 3 will take cooling water from the Monticello Reservoirs, the construction and operation of certain aspects of the Units will require FERC approvals. The process for NRC/FERC interaction related to these approvals and the length of time required for FERC review and issuance of approvals is not well defined at present. SCE&G does not foresee any difficulty in obtaining the required FERC approvals, but the FERC approval process could delay the construction schedule and impose additional costs.

Other State and Federal Permits – SCE&G will need to obtain a substantial number of other permits from the State of South Carolina, the Corps of Engineers, and other regulatory bodies to complete the construction of the Units and place them into operation. A list of those permits is attached as **Chart B** to **Exhibit J**.

SCE&G's assessment of the risks related to these permits is similar to its assessment of the risks related to the COL process. SCE&G is not aware of any facts that would indicate that any of the permits would be difficult or impossible to obtain on reasonable terms or schedules. The facts at SCE&G's disposal presently indicate that the permits listed on **Chart B** should be available on reasonable terms and conditions, and on a schedule that supports the timely construction of the Units as set forth in other parts of this Application. However, SCE&G recognizes the risks related to these permits are risks of constructing the Units. Difficulty or delay in obtaining these permits could have an adverse impact on SCE&G's ability to meet its construction schedules, and could increase the cost of the Units either through delay costs or though additional costs required in meeting regulatory requirements.

Political, Legislative, Regulatory or Public Opinion Risks – Concerns about climate change, about America's dependency on imported energy supplies, about the recent volatility of natural gas prices, and about the availability of future natural gas supplies, as well as the U.S. nuclear industry's 20 year track record of safety, efficiency and reliability, have all contributed to a political, legislative, regulatory and public climate that is supportive of nuclear generation. However, events that are hypothetical and difficult to predict could result in a change in the current level of political, legislative, regulatory and public support for nuclear generation in general or for the Units specifically. Such a change could in turn result in additional costs, delays and difficulty in receiving permits, licenses or approvals for the Units, and possibly could place the cost and schedule forecasts for the Units in jeopardy. While such events are difficult to predict or envision, any major event that casts doubt on the continued safety and reliability of nuclear power, of the Westinghouse AP1000 design, or the suitability of the VCSNS site for additional nuclear units could result in such a reversal.

4. ENGINEERING RISK FACTORS

Final Engineering of the Units – As discussed above, the NRC has issued a Final Design Approval for the Westinghouse AP1000. The Reference Unit COL application has been submitted to the NRC and review of that application is underway. Nevertheless, under the current NRC licensing approach, there is engineering work related to the Units that will not be completed until after the COL is issued. Any engineering or design changes that arise out of that work, or the engineering or design changes required to address problems that arise once construction is underway, are potential risks which could impact cost schedules and construction schedules for the Units. While SCE&G expects some design changes in the due course of finalizing the design and engineering of the Units, SCE&G is not aware of any specific risks or problems related to the engineering remaining to be done, and does not have information that would lead it to believe that any material or significant change in the design or engineering of the Units will be required as a result of the remaining engineering or construction. Nonetheless, SCE&G considers these sorts of design and engineering-related risks to be risks to which the Units are subject.

Design-Related Vendor Risks – The Units, like other generation plants and other complex industrial facilities, are designed to use plant components that are generally available in the industry. As with all such plants or facilities, there is risk that component manufacturers may exit the business or change the design of their products such that they are no longer suitable to meet the requirements of the Units' design. Were this to occur, alternative components would need to be indentified and included in the design, or the design would need to be otherwise modified to do without the unavailable component. Such events could result delay in the construction schedule or additional cost. SCE&G is not aware of any specific risks in this regard, nor has it identified any components or suppliers likely to pose such risks, but considers this design-related vendor risk as a risk which the Units share with other similar types of facilities.

5. PROCUREMENT AND TRANSPORTATION RELATED RISK FACTORS

Availability of Qualified Suppliers and Manufacturing Capacity – VCSNS Units 2 & 3 are being built at the beginning of a new cycle of nuclear construction. The Units are also likely to be among the first of a dozen or more new Westinghouse AP1000 units to be built in the United States. The supply chain for nuclear-grade plant components has not been supported by new construction for some decades and will need to be significantly expanded to meet the requirements of this new construction cycle.

In this context, it is helpful that Units will be built at the leading edge of the cycle, and should have the first call on the suppliers and manufacturing capacity that exist today. Nonetheless, the volume of anticipated nuclear construction around the world may create shortages in this capacity which may lead to increased costs and schedule delays in obtaining key components. Natural disasters, disruptions in normal industrial operations, material shortages, political unrest and other force majeure-type events could disrupt this supply chain. Such disruptions could in turn delay construction and increase the cost of the Units. SCE&G is not aware of any specific risks or problems related to the component supply chain and the manufacturing capacity that supports it. However, SCE&G does consider supply chain risk to be one of the risks to which the Units are subject.

Manufacturing and Quality Issues – Quality controls and manufacturing standards for components for nuclear plants are very stringent and the processes involved may place unique demands on component manufacturers. It is possible that manufacturers of unique components (*e.g.,* steam generators and pump assemblies or other large components or modules used in the Units) and manufacturers of other sensitive components may encounter problems with their manufacturing processes or in meeting quality control standards. Many of the very largest components and forging used in the Units can only be produced at a limited number of foundries or other facilities worldwide. Any difficulties that these foundries or other facilities encounter in meeting fabrication schedules or quality standards may cause schedule or price issues for the Units. SCE&G is not aware of facts that would indicate that such problems exist or are likely to occur. But if such problems do occur, they could lead to schedule delays for the Units and increased costs and so are properly considered risk factors related to the project.

Shipping Issues – Many of the components and assemblies for Units are quite large and pose unique shipping and delivery challenges. Some of the very largest components and assemblies will be fabricated in the Far East, shipped across the Pacific Ocean to Charleston or other U.S. East Coast ports, off-loaded, and then shipped by rail to the construction site. Certain of these assemblies will be as large as any items that are typically handled by the shippers involved.

In addition, much of the plant will be constructed using advanced modular construction techniques. Many of these modular components will be fabricated off-site at facilities dedicated to supporting construction of the AP1000 units. Those modules will be delivered by truck or rail to the Jenkinsville site for assembly. Regular and timely delivery of these components to the site is an important condition for successfully meeting the schedule and cost projections for construction.

If shipping problems for components and assemblies occur; if loss or damage occurs to unique assemblies during shipping and delivery; if damage or disruption were to occur to ports or rail facilities due to natural disasters, political unrest or other causes; or if rail lines serving the site were to prove to be inadequate, this could cause schedule impacts and additional cost for the project. SCE&G believes that the shipping issues are manageable, but shipping risk is a risk of construction.

6. CONSTRUCTION RISKS

Benefit of Standardized Designs and Advanced Modular Construction – As indicated above, the construction of the Units will employ standardized designs and advanced modular construction processes. The project schedule and costs are based on efficiencies and economies anticipated from the use of these techniques. The projected benefits and the resulting schedules and cost estimates reflected in this Application appear to be reasonable. However, standardized design and advanced modular construction has not been used to build a nuclear facility in the United States to date. The construction process and schedule is subject to the risk that the benefits from standardized designs and advanced modular construction may not prove to be as great as anticipated.

Rework and Repair Risks – Westinghouse has contracted to supply the AP1000 design and selected components for four AP1000 units in China, and as of the time of this application, Westinghouse/Stone & Webster has signed an EPC contract with the Southern Company for the construction of two AP1000 units at the Plant Vogtle site on the Savannah River near Augusta, Georgia. While SCE&G believes the AP1000 to be a superior design, and has full confidence in the ability of Westinghouse and Stone & Webster as suppliers and contractors, it is nonetheless true that no AP1000 units have yet been built. Accordingly, problems may arise during construction that are not anticipated at this time. These problems may require repairs or rework to be corrected. Repairs and rework pose schedule and cost risk resulting both from the repair and rework itself, and from the time and expense required to diagnose the cause of the problem, and to plan, review and approve the work plan before implementation. Westinghouse and Stone & Webster have great experience and expertise in construction of power plants, and should be able to anticipate and avoid, or efficiently correct, construction problems as they become apparent. Nonetheless, repairs and rework represent a construction related risk of the AP1000 units.

Labor Risks – The construction of the Units will require a workforce of several thousand people at its peak. Many of the jobs involved will require workers with specialized construction skills such as specialty welding, pipefitting and electrical skills. In addition, successfully completing the project will require the recruitment and retention of skilled construction managers and supervisors.

- **Cost and Availability Risks –** The availability of the necessary employees, managers and supervisors for constructing the Units will depend on a number of factors, including overall economic and construction-related activity in the region, and the number of nuclear plants under construction in the region at the time the Units are being built. As one of the first nuclear construction projects anticipated to get underway in the current construction cycle, the SCE&G construction project should have an advantage in attracting the required personnel over projects beginning later. But staffing risks for the Units include both the possible shortage of required workers, which could impact both schedule and costs, and the risk that bidding for the available work force will raise labor costs to levels higher than anticipated. Some inflation in labor costs is built into the cost projections and project pricing. However, actual inflation in labor costs could be higher than expected. Labor price and availability risks are important risks of the projects.

- **Training Risks –** Part of the challenge related to construction staffing will be that of properly training personnel in the skills necessary to successfully complete the project. Training costs can be a significant part of the project costs. If the construction labor force cannot be brought to the proper skill level, or maintained at that level in the face of employee turnover, then there will be a risk of excessive rework, schedule delays and increased costs.
- **Language Issues –** For a large number of construction workers, English may be their second language or they may have limited English skills. Making provisions for a large non-English speaking component of the work force may result in efficiency losses and require incurring additional costs for translation services.
- **Fitness for Duty Regulations –** The NRC has issued fitness for duty regulations for nuclear plant construction workers. Fitness for duty regulations are intended to provide reasonable assurance that nuclear plant personnel, including construction personnel, will perform their tasks in a reliable manner; that they are not under the influence of any substance, legal or illegal, that may impair their ability to perform; and that they are not mentally or physically impaired from any cause, including fatigue, illness or emotional distress, that can adversely affect their ability to competently perform their duties. Requirements under these regulations include pre-employment screening, drug and alcohol testing (with appropriate privacy protections), post-accident testing, and on-the-job behavioral awareness. Non-nuclear personnel are likely to be unfamiliar with the requirements imposed by these regulations. Concerns about the tests, or the failure to meet their requirements, may lead to increased turn-over or difficulty in hiring sufficient numbers of skilled employees, supervisors and managers.
- **Strikes or Walkouts –** While union activity is not as common in South Carolina as in other states, organization of the workforce for the Units is possible and labor disputes could result in strikes or walkouts.

These individual labor-related risks are part of the overall challenge of recruiting, training, retaining and supervising a large, diverse and highly-skilled work force to construct the Units. SCE&G believes these labor-related risks to be manageable, but they do constitute major risks related to the construction of the projects.

Scope Increases – Construction scope increases can result from changes in regulation, design changes, changes in the design and characteristics of components of equipment, and other similar factors. Many of the reasons for scope changes have been discussed in specific contexts above. In general, scope changes involve the cost and delay of redesign work, and of implementing the expanded scope. Scope changes represent an important category of risk to which the project is susceptible.

Transmission Siting and Construction – Transmission-related costs are properly considered as part of the capital cost of a plant for the purposes of Base Load Review Act proceedings. However, the Company does not plan to design and permit off-site transmission facilities for VCSNS Units 2 & 3 until the later stages of plant construction. This delay will allow the transmission lines to be configured to suit the needs of SCE&G's transmission system as they may evolve over the course of the construction period. The actual transmission costs associated with the Units will depend on the final routing and design of the transmission facilities, the cost of right of way along the route chosen, the schedule and cost of the right of way acquisition and siting processes, and the cost of transmission construction at the times the lines are built.

7. OPERATIONAL RISKS

General Operations – SCE&G has successfully operated and maintained a Westinghouse Pressurized Water Reactor, *i.e.*, VCSNS Unit 1, for more than 20 years. SCE&G's operations have consistently received high ratings by the NRC and by Institute of Nuclear Power Operations (INPO) and the availability factors for the plant have been very good. All the resources necessary for supporting the operations of such a unit are in place and functioning well at the Jenkinsville site.

Adding two new AP1000 units to the site will require significant expansion of SCE&G's existing staff and capabilities. Recruiting, training and retaining the required staff is one of the risks related to operation of the plant, but it is a risk SCE&G believes that can be managed without undue difficulty.

Spent Fuel Storage – Each unit of VCSNS Units 2 & 3 will have the capability to store 18 years of fuel discharges from the reactor in its spent fuel storage pool. In the next several years, SCE&G will have to construct and place into operation a secure dry-fuel storage facility at the Jenkinsville site to receive and hold spent fuel from VCSNS Unit 1. This facility will be constructed large enough to facilitate storage of spent fuel from Units 2 & 3. The dry-fuel storage facility will have the capability to hold spent fuel safely until a permanent repository for it is available. SCE&G does not believe that spent-fuel storage is a material risk factor related to operation of the Units.

Fuel Cost Risk – SCE&G believes that nuclear fuel for its reactors will be available in sufficient quantities and at reasonable prices during the course of its operation of the Units. The cost of nuclear fuel has risen recently in response to the resurgence of interest in nuclear generation. However, SCE&G is not aware of any reason to believe that supplies of nuclear fuel or nuclear fuel fabrication capacity will be unduly constrained in the long-term. Moreover, the cost of fuel is a much smaller part of the cost of nuclear generation than it is for generation from fossil fuel sources. Accordingly, the economics of nuclear generation are much less dependent on fuel costs than are the economics of coal- or natural-gas-fired generation.

8. FINANCIAL AND GENERAL INFLATION RISKS

Financial Risk – As other exhibits show, construction of the Units will require the Company to access large amounts of capital on regular intervals to make the required payments to Westinghouse and Stone & Webster, and to fund its own internal costs related to the project. SCE&G believes that it will have access to the required capital on reasonable terms during the construction process. The present Base Load Review Act proceeding and future revised rates filings will play a critical role in the Company's ability to obtain that capital.

Nonetheless, instability in global or U.S. capital markets, future developments which bias capital markets against investments in nuclear power, or developments which call into question the future financial integrity of the Company or its ability to recover its costs of utility operations in a timely way, all could restrict SCE&G's access to capital on reasonable terms. Scope changes or cost increases that result in additional requirements for capital could also present financial challenges to the Company. Anything that might cause the Company to lose the ability to access required capital in a timely way could result in disruption of the construction process and schedule, and represents a potential risk factor for the construction of the Units.

Inflation and Supply Shortage Risks – Inflation related to nuclear construction labor, and to nuclear-plant materials and components has been discussed above. In addition, inflation in the cost of standard construction inputs like cement, steel, copper, nickel, gasoline and diesel fuel, all could result in increased costs for constructing the Units. Increasingly globalized markets have resulted in increased competition for supplies of such standard construction materials. Inflation is often accompanied by supply shortages. SCE&G has built reasonable inflation projections into its cost projections for the project. Nonetheless, supply shortages and unanticipated levels of price inflation for standard construction inputs represent a risk both to cost projections and schedule projections for constructing the Units.

9. SEVERE WEATHER AND NATURAL AND MAN-MADE DISASTERS

Severe Weather and Natural and Man-Made Disasters – The timely and successful construction of the Units depends on a supply chain that is global in scope as well as on conditions localized at the Jenkinsville site. Severe weather and natural and man-made disasters at any point in that supply chain can interfere with the progress of the construction and affect both price and schedule risks. The problems disasters pose are most acute if they occur at sites which are vital to the manufacture or transport of unique and specialized components, or at the construction site itself. The list of potential natural and man-made disasters that could cause cost increases or schedule delays includes all the disasters commonly cited as examples of force majeure, and include: hurricanes, tornados, earthquakes, floods, landslides, fires, explosions, tsunamis, lightning-strikes, war, riots, sabotage, prolonged rains or cold weather at the site, railway or bridge failures, epidemics, and terrorist attacks. Insurance may provide protection against some of the cost of these events, but insurance may not cover all risks, and schedule delays may be unavoidable.

10. CONCLUSION

For a project of the scope and complexity of the licensing and construction of the Units, any list of potential risk factors compiled at this stage of the process will not be exhaustive. Risks that are difficult to predict or envision may arise during licensing and permitting that disrupt current cost or schedule forecasts. Nevertheless, SCE&G has reviewed the risks related to constructing the Units carefully and over an extended period of time. It has compared those risks to the risks of the other alternatives that are available to meet the energy needs of its customers and the State of South Carolina. SCE&G has also sought to manage the risks of constructing the Units by fixing costs, to the extent commercially reasonable, under the EPC Contract with Westinghouse/Stone & Webster, and by applying reasonable schedule and cost contingencies to the project. Based on the above, SCE&G has concluded that the benefits from constructing the Units and adding them to its system outweigh the risks as it understands them, particularly considering that this energy source involves significant no air emissions, is highly reliable, and is not subject to the fuel price risks or fuel availability risks that affect the fossil generation resources. SCE&G has concluded that constructing the Units is the most prudent and responsible course it can take at this time to meet the base-load generation needs of its customers.

But no project of this scope can expect to be completed without some risks or disruptions. In the end, this project’s ability to meet its current schedule and cost projections will depend on the cumulative effect of those risk events that do occur on the schedule and cost projections contained in this Application. SCE&G will monitor these risks and their effects carefully. It will inform the Commission and the public if the effects of risks that do occur begin to fall outside of the cost and schedule contingencies built into this Application.

EXHIBIT J
Chart A
Certain Risks Associated with Construction and Operation of the Facilities

Types of Risk	Schedule Delay	Increase Cost
1. Regulatory Risks		
a. Office of New Reactors		
i. New 10CFR52 licensing process proceeds slowly due to complexity and/or resource issues	Yes	Yes
ii. Intervention results in lengthy NRC hearings	Yes	Yes
iii. New NRC regulations issued causes scope additions	Yes	Yes
iv. ITAACs		
1. Resolution of ITAACs delays fuel load	Yes	Yes
2. New ITAACs causes scope addition	Yes	Yes
b. NRC Region II		
i. Construction Inspection Process proceeds slowly due to complexity and/or resource issues	Yes	Yes
c. FERC license approval process proceeds slowly due to complexity and/or resource issues	Yes	Yes
d. State & local permits process proceeds slowly due to complexity and/or resource issues	Yes	Yes
2. Engineering Risks		
a. Completion of design results in changes to existing design	Yes	Yes
b. Construction problems require design changes	Yes	Yes
c. Equipment vendors go out of business or change products	Yes	Yes
3. Procurement Risks		
a. Inadequate number of qualified suppliers	Yes	Yes
b. Manufacturing problems causes delays	Yes	Yes
c. Shipping problems delay equipment arrival to site	Yes	Yes
4. Construction Risks		
a. Construction duration estimates are too optimistic	Yes	Yes
b. Construction problems requires rework/repair	Yes	Yes
c. Labor issues (strikes/inadequate supply) causes delays	Yes	Yes
d. Lack of proper training results in mistakes	Yes	Yes
e. Large non-English speaking workforce	Yes	Yes
f. Workers do not meet new fitness for duty standards	Yes	Yes
5. Operational Risks		
a. Inability to hire sufficient qualified people to operate plants	Yes	Yes
6. Financial Risks		
a. Cost of money limits ability to raise sufficient capital	No	Yes
b. Rising inflation & competition drives equipment and commodity prices upward	No	Yes
c. Scope increases require additional funding	Yes	Yes
7. Uncontrollable Circumstances		
a. Severe weather	Yes	Yes
b. War/sabotage/terrorist attack	Yes	Yes

EXHIBIT J
Chart B

Major Non-NRC Permits, Licenses, and Authorizations List

1. Federal Energy Regulatory Commission (FERC) Order for Non-Project Use of Project Land & Waters

Upon application to the FERC, the FERC will review, and if found not to be inconsistent with the provisions of the FERC Project 1894 (Parr/Monticello Hydroelectric Project) License, it will issue its order approving the construction of the inlet lines for the water treatment plant as well as intake and discharge structures (lines) for the Units 2 & 3 cooling towers crossing Project properties, and such other non-project use of Project resources, including land and water as will be necessitated by construction and operation of Units 2 & 3.

2. U. S. Army Corps of Engineers (COE) 404 Wetlands Permit

A permit is needed to disturb land and in some cases to fill areas determined to be wetlands and officially delineated by the COE.

3. Siting Act Certification for the Transmission Facilities

As indicated in **Exhibit Q** to this Application, additional transmission facilities will be required to integrate the Units into SCE&G's electric grid. Those transmission projects will be permitted separately from the permitting of the generation facilities with which they are associated.

4. Section 401 Water Quality Certification

A Section 401 Water Quality Certification by the South Carolina Department of Health and Environmental Control (DHEC) will be necessitated as a result of the need to secure a Section 404 permit. The review will be conducted in concert with the 404 wetlands permit process.

5. Part III Construction & Demolition Landfill Permit (Solid Waste Permit)

A DHEC Solid Waste Permit is needed for an Industrial Landfill for the purpose of disposal of construction, demolition, and land-clearing debris.

6. NPDES Stormwater Permit for Land Clearing

A DHEC issued Stormwater Permit is required for any land disturbing activities. This includes all land clearing activities such as grubbing and excavating of soil from the site.

7. **SCDHEC/S.C. Fire Marshall Blasting Permit**

Permits are required should it become necessary to blast rock that cannot be removed by other means.

8. **SCDOT Site Access Road Permit**

A permit is needed for enhancing the roadway at the intersection of Parr Rd. and Hwy. 213 to facilitate safer passage of construction traffic.

9. **Construction Facilities Building Permit**

Permits are needed for construction of buildings in the "construction city area."

10. **SCDHEC Concrete Batch Plant Permit**

A permit is needed to install a concrete batch plant onsite to produce concrete for the construction project.

11. **Concrete Batch Plant NPDES Discharge Permit**

A permit is needed to discharge water from the concrete batch plant into "Waters of the State."

12. **Dredge and Fill (COE) Permit**

A permit is needed for dredging areas in Parr Reservoir when installing a discharge pipe for Units 2 & 3.

13. **SCDHEC Bureau of Air Quality (BAQ) Permits**

A construction permit exemption is needed from BAQ for emergency generators, boilers (if applicable) and any other stationary sources exhausting emissions into the atmosphere at the water treatment plant/wastewater plant. This also applies to any future equipment on the site that emits to the atmosphere.

14. **SCDHEC Construction Permit for Water Treatment Plant**

A permit is needed to construct the building/equipment/lines for the Water Treatment Plant.

15. **NPDES Water Permit for Water Treatment Plant**

A permit is needed to produce water from the Water Treatment Plant.

16. **NPDES Wastewater Permit (discharge water coming from Water Treatment Facility)**

A permit is needed to discharge water from the Water Treatment Plant into Monticello Reservoir.

17. **NPDES Wastewater Permit (discharge water coming from Wastewater Package Plant)**

A permit is needed to discharge water from the Wastewater Package Plants (2 plants) into Mayo creek and Parr Reservoir.

18. **Construction Permit for Wastewater Package Plant**

A permit is needed to install two wastewater package plants (construction city area and on the table top area) into Mayo Creek and Parr Reservoir.

19. **Federal Aviation Administration Permit**

A permit is required from the FAA for Lampson construction cranes, because they will be over the height of 200 ft.